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TEXTILE WORLD RECORD

LORD & NAGLE COMPANY · Boston & Philadelphia

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Reports of the Convention of the American Cotton Manufacturers' Association and of the National Association of Hosiery Manufacturers are contained in this number.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

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ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

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OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
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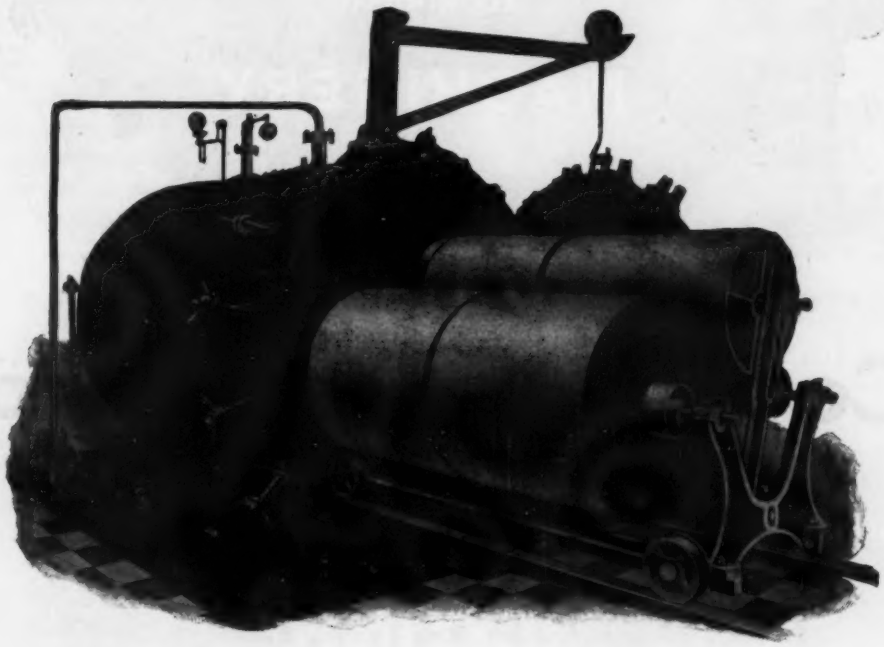

H. W. Butterworth & Sons Co.

Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

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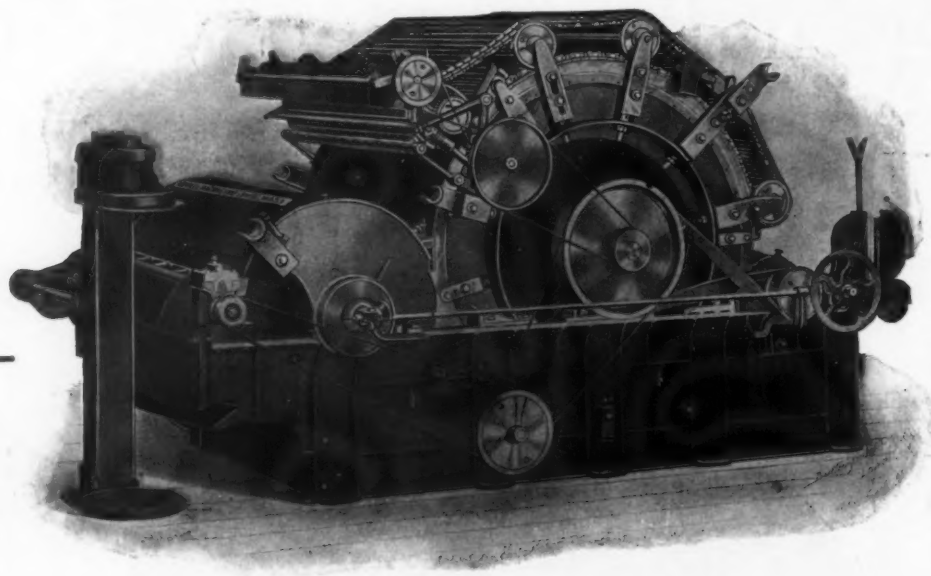
Sole Makers for the United States



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With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

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Plans, Specifications and Estimates furnished upon application.

Lowell Machine Shop

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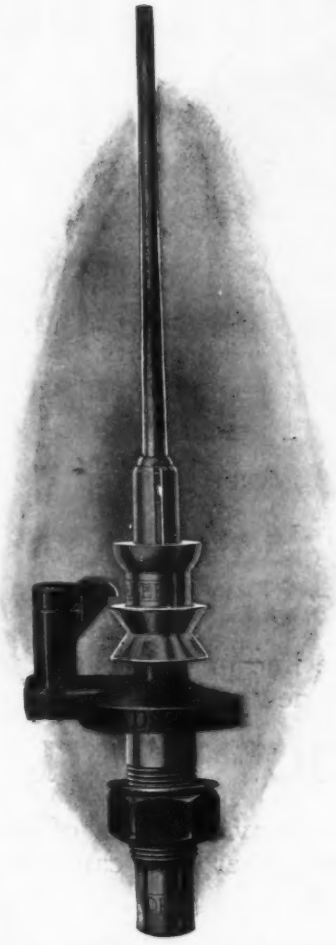

The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

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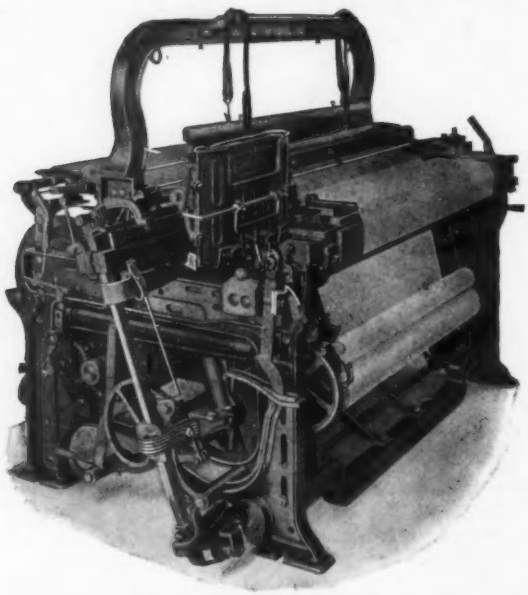

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History Repeats Itself

Our previous successful efforts in the line of improvements in weaving machinery have culminated in our new

IDEAL AUTOMATIC LOOM

Considering quantity of goods produced per weaver, quality of goods, cost of supplies, repair bills, etc., there is no other loom can compare with it for economy of operation.

Cop or bobbin filling may be used equally well. One weaver can operate successfully from twelve to thirty looms, and under favorable conditions even more. No reduction in speed. A high grade plain loom as a basis.

Write for further particulars

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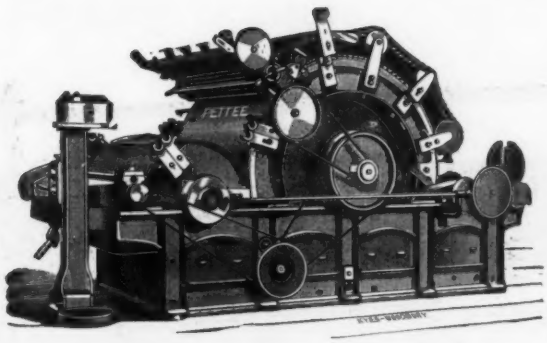

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DRAWING FRAMES,
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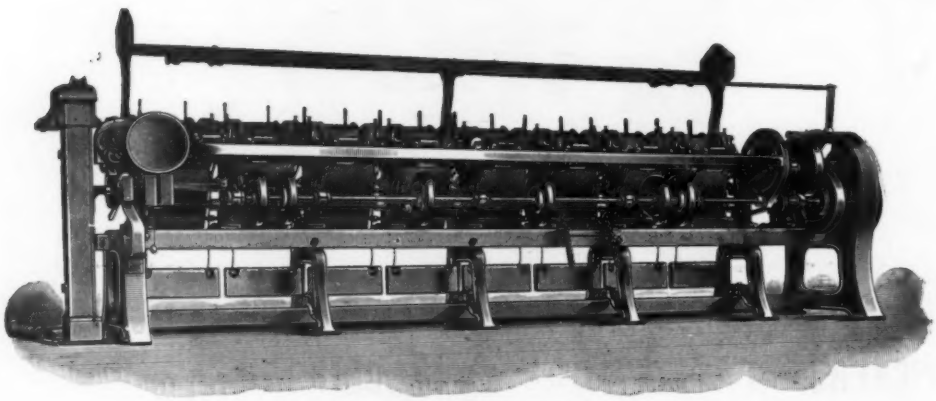

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Ribbon Lap Machines,
Combers,
Railway Heads,
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Spoolers,
Twisters,
Reels,
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Blowing Systems

For Conveying Bale Cotton
from Storehouse to Picker-room

Self-Feeding Openers
Lappers and
Cleaning Trunks

Waste-Working Machinery

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ATHERTON MACHINE CO., - - Lowell, Mass.
A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

Kitson Machine Shop

Lowell, Mass.

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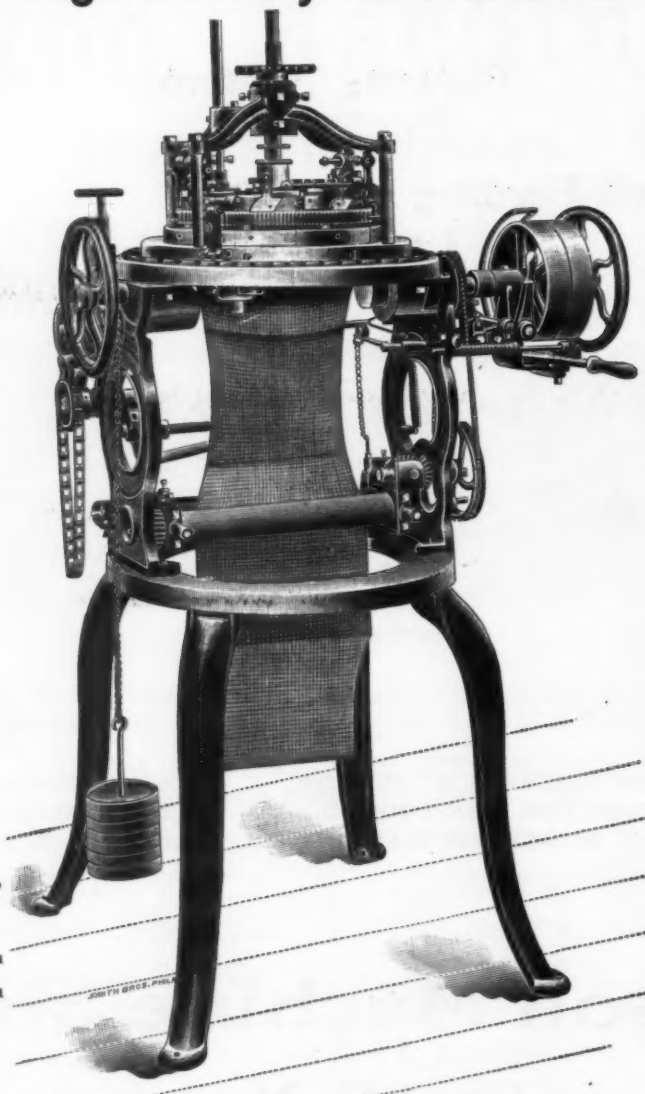
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes. 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

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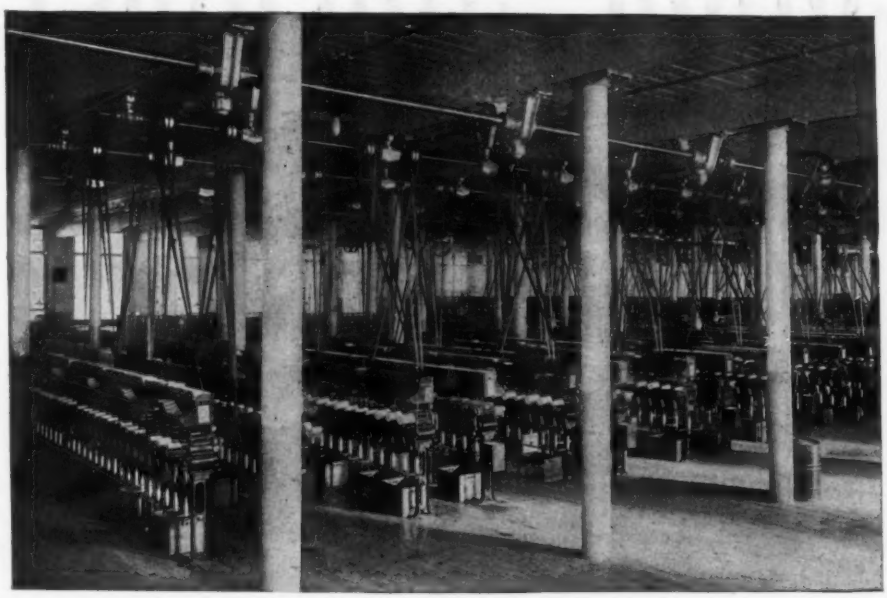

THE ABOVE CUT FROM PHOTOGRAPH SHOWS A RECENT INSTALLATION OF OUR

No. 50 SELF OILING

MACHINES IN ONE OF THE NEWEST EASTERN FINE YARN MILLS FOR CONING AND TUBING

We ask your careful investigation of our machines and system of winding

Universal Winding Co., Boston

MASON MACHINE WORKS,

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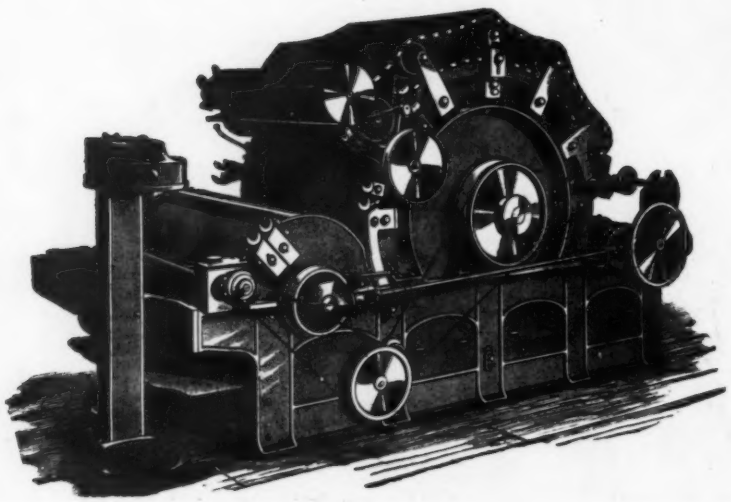

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Plain and Fancy Silk Looms

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Platt's Special Machinery for Making French Worsted Yarns.
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Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

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Flax, Hemp and Jute Machinery.

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Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

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The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

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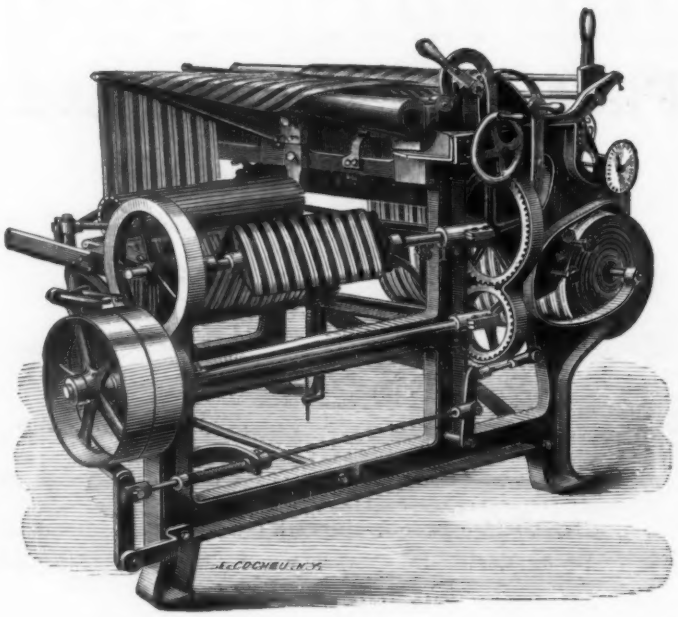


IT is rapidly becoming the practice among manufacturers of specialties to print their name or trade mark on the selvedge of their goods. This is the only machine for the work.

PARKS & WOOLSON MACHINE CO
SPRINGFIELD VERMONT

Formerly built and sold by the Fabric Measuring & Packaging Company, New York City

Jacob K. Altemus is

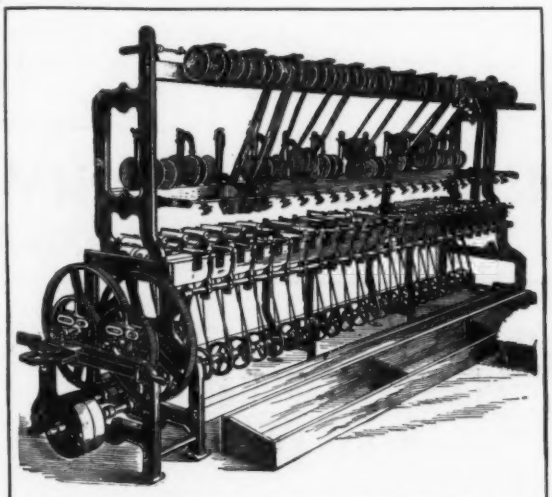
Able to supply the best

Cop Winding Machinery

Or Hosiery Winders and more in particular

Bobbin Winders,

Keep in mind that I



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Always produce machines that are right

Letting nothing go out

That is not satisfactory before delivery.

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Manufacturer should investigate warping and beaming machinery, warp splitting as well,

Upright Spoolers, Quillers, Warpers, Twisters, etc.

Send for full information and prices.

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HARWOOD'S MACHINERY

Increases Production, Improves Quality, Decreases Labor Cost.

THE MODERN BRAMWELL FEED FOR WOOL WASHERS AND WOOL DRYERS

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Cloth Washers, Dye Tubs, Vats, Fulling Mills,
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Spindles and Flyers, for Cotton, Wool, Silk, Flax, etc.

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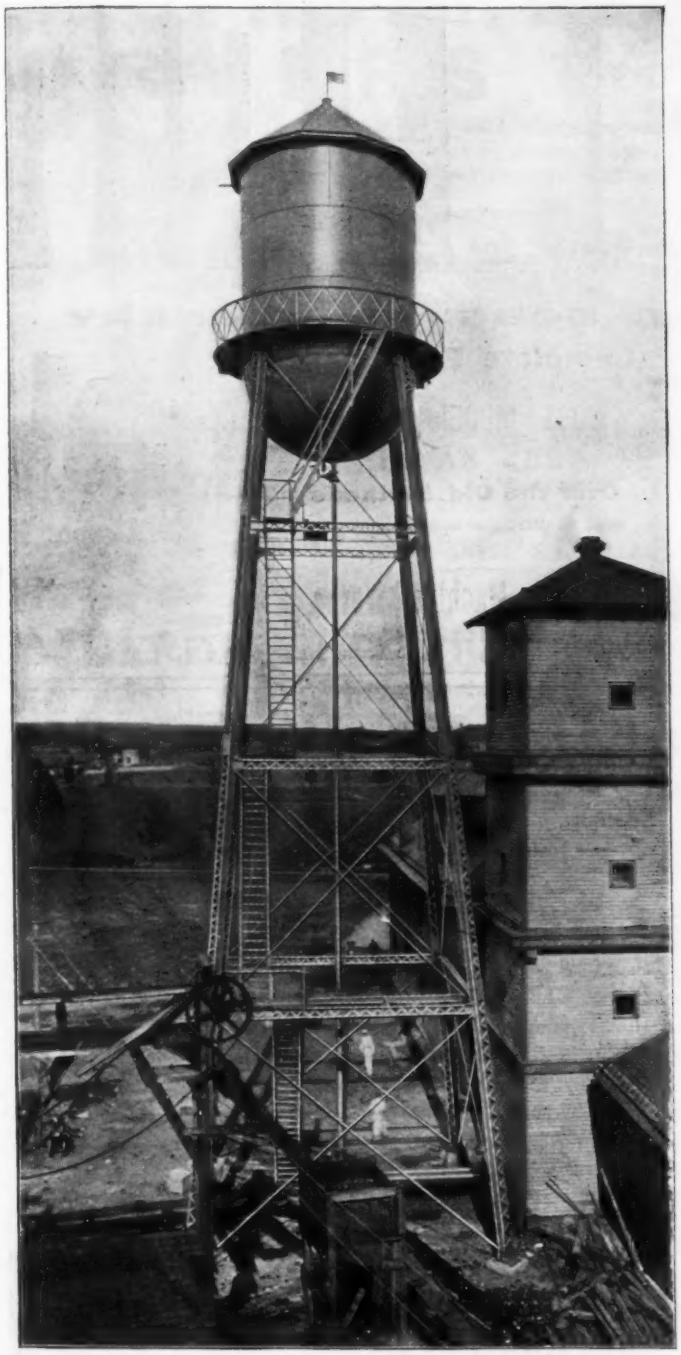

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They provide a storage for water under pressure, and are valuable for fire protection and personal uses

The T. & W. Towers do not fall or leak.

All Sizes Built

Plans and prices given on application.

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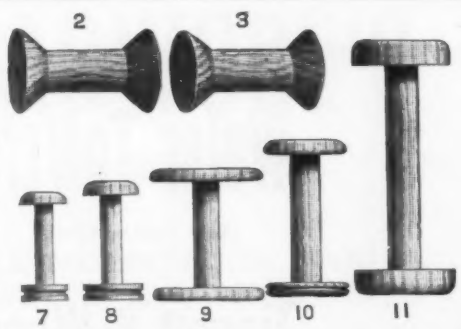
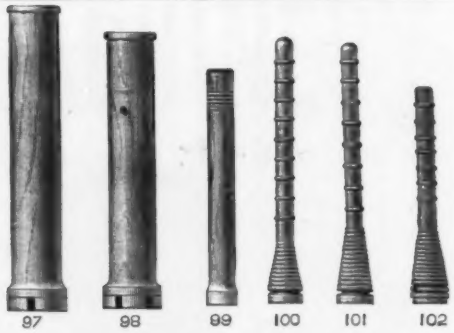
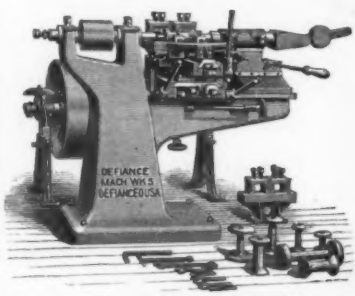




SPOOL AND BOBBIN MACHINERY



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Complete Equipment
OF THE
MOST MODERN TOOLS
25% SAVED
Over the Old Methods
Send for Catalogue and Particulars to
THE
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Making Endless Belts.

Skiving and gluing is one way to make endless belts, but it's a mighty slow and old fashioned one when compared with the work of the

Jackson Belt Lacer.

With it a 5" belt can be made endless in less than three minutes at a cost of one cent for the lacing (larger belts in proportion). That is quite an improvement, isn't it? Well, just let us add that belts laced in this manner may be shortened or lengthened in a few seconds, and as often as desired, so that you not only save time and money, but your belts become interchangeable and can be thrown from one machine to another to meet any emergency.

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Birdsboro, Pa.

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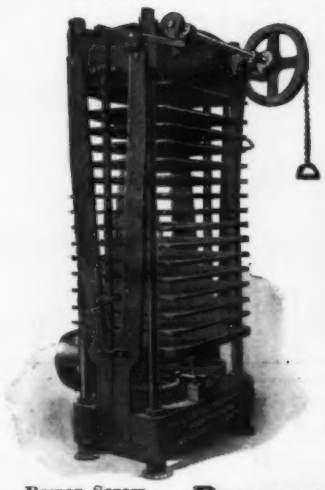

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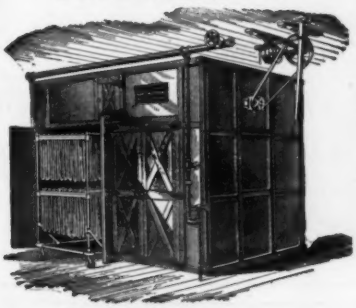
For Wool, Cotton Stock, Yarn, Stockings, Underwear, Etc.



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"Hurricane" Fan, Style No. 3. Write for Catalogues.

COMPLETE EQUIPMENTS FOR DYEING, SCOURING, BLEACHING, CARBONIZING, OXIDIZING, CHROMING, Etc.

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LAWSON BRANCH,

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MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

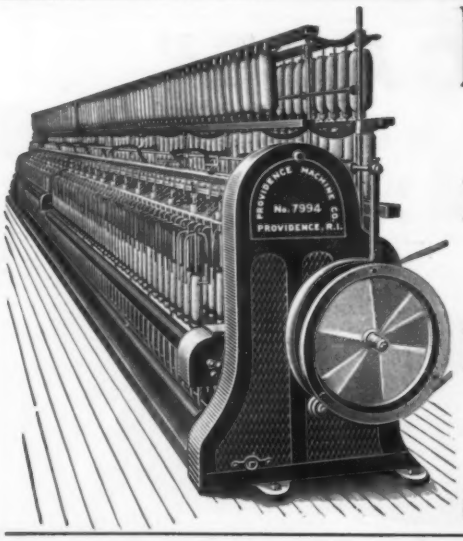
AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.



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Manufacturers of

Improved Cotton
Roving Frames

Improved Worsted
Roving Frames

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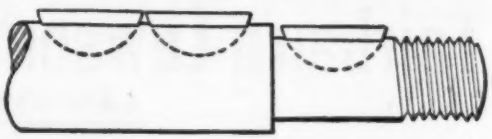
REVOLVING FLAT CARD BRUSHES

S. A. Felton & Son Co. FOR USE ON ALL MAKES OF REVOLVING FLAT CARDS Manchester, N.H.

Key Seating Attachment
FOR
Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

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The Best Lubricating and Softening Product

FOR WOOL, COTTON, WOOL AND COTTON MIXED

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Absolutely free from Mineral Oils, Saponifies Perfectly, Odorless, Pure White and Stainless. Washes out Perfectly and Easily. Great Economy Guaranteed in its Use. Write for samples, prices and full particulars

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Farrel Foundry & Machine Co.

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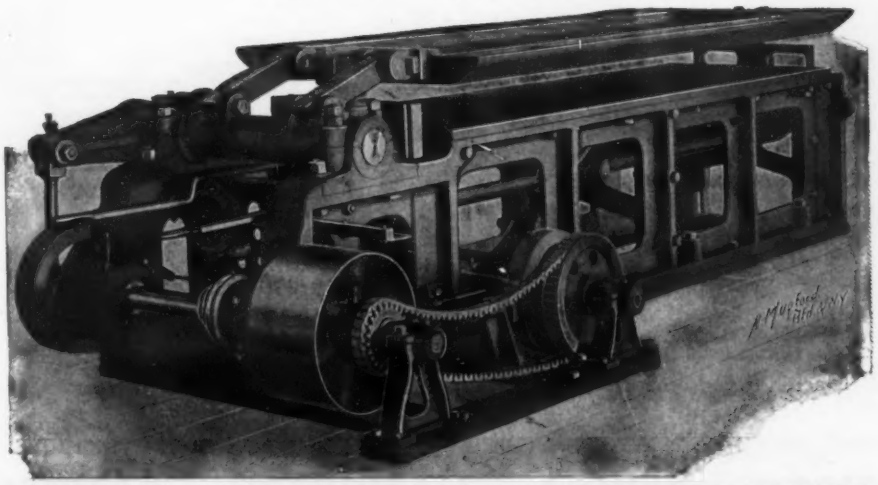

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Chilled and Soft Iron Rolls, Machine Moulded and Machine Cut Gearing, to 20 ft. diameter. Heavy Transmission Machinery, Etc., Etc.
Heavy Castings, in Gray Iron or Semi Steel.

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Incorporated 1867.

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From ONE to FOURTEEN COLORS,
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ALSO

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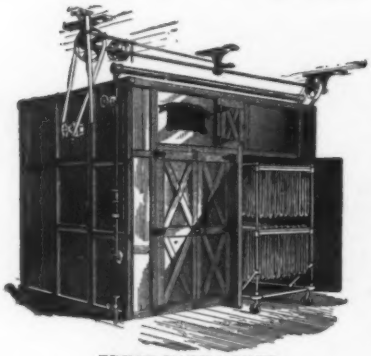

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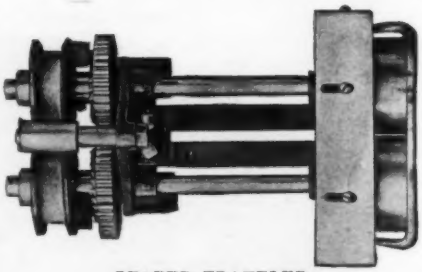
Dryers for Wool and Cotton Stock, Yarn, Stockings and Underwear.

Carbonizers, Yarn and Wool Scouring Machines.

Ventilating Fans, Bleachers.



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We also manufacture Kershaw's Geared Traveler and Improved Web Feed.

Garnett Machines and Pickers. Reclothing or furnish New Metallic Toothed Cylinders and Feed Rolls.

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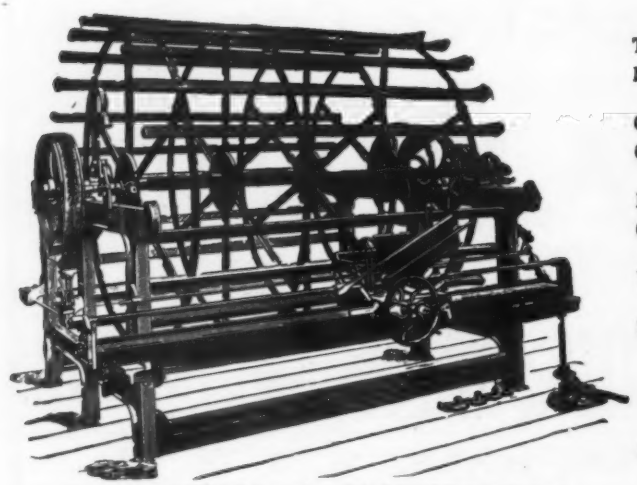
Wm. Whiteley & Sons Ltd.

LOCKWOOD, HUDDERSFIELD.



WARPING MILL WITH PATENT SECTION DIVIDER.

Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

Mercerizing Machinery.

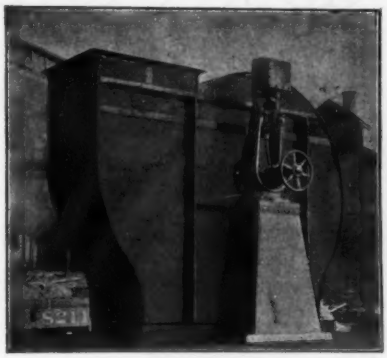
Second-hand Tentering Machines in good repair at low prices.

SPINDLES

EASTON AND BURNHAM MACHINE CO.

PAWTUCKET, R. I.

REPAIRS FOR RABBETH SPINDLES



Our Fan Business is Booming

In recent advertisements we have described some of the improvements that we have introduced in the design and manufacture of air moving apparatus, such as angle-iron stiffening rings for the wheels, angle-iron fastenings for the floats, extra-heavy housings and bracing, accurate adjustment for running balance, an improved type of planing-mill exhauster, short overhang on large exhausters, ring-oiled bearings, etc. It is our aim to make fans as good as possible and buyers appreciate the fact.

We are selling these fans for every commercial purpose :—

MECHANICAL DRAFT,
HEATING and VENTILATING,
CONVEYING MATERIALS,
DRYING and MOISTENING,
Etc., Etc.

The picture shows a Mechanical Draft Exhauster built for the woolen mills of Geo. E. Kunhardt of Lawrence, Mass. It will service a boiler plant of 1050 H. P. capacity.

If you are in the market for fans, blowers and exhausters, or steam heating coils, send us full particulars and we will make an estimate. Our engineering skill and 60 years of experience are at your service.

Ask also for our Catalogue "TW" of Fans, Blowers and Exhausters, and if you do not have a copy, for the Book on Power Plant Economy, also.

THE GREEN FUEL ECONOMIZER CO.

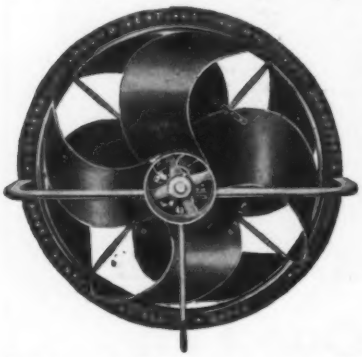
Matteawan, N. Y.

GEO. H. GIBSON CO. PARIS NEW YORK

(Sole Builders of the Green Fuel Economizer in the U. S.)

COMPOUND—THAT'S WHY

Barney Compound Ventilating Fans Ventilate, Purify, and Dry.



Notice the compound feature—it does the work. They force out all atmosperic impurities and draw in pure air. They often double capacity of drying rooms, expel loose steam from dye houses—preventing condensation, *cool spinning rooms.*

The Barney System is the most economical.

TELL US YOUR PROBLEM.
WRITE TODAY. FREE TRIAL OF FAN.

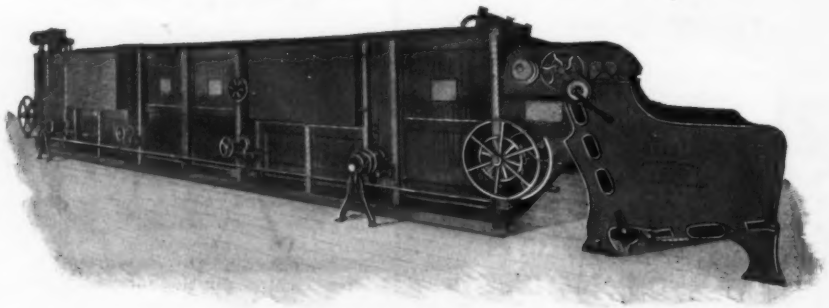
BARNEY VENTILATING FAN WORKS, 24-28 Binford St., Boston, Mass.

Whether You Buy or Build
New Machinery, Embody in Specifications
Dust Proof Oil Hole Covers
Modern Machine Construction calls for Modern Improvements and D. P. O. H. Covers are a Dividend Paying Investment
Postal will bring Samples and Catalog.
W. & C. F. TUCKER, - - HARTFORD, CONN.

C. G. SARGENT'S SONS

CORPORATION

GRANITEVILLE, MASS.



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Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
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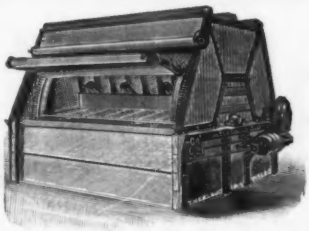

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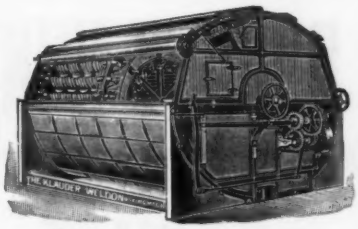
MACHINES
sold on
2 MONTHS' TRIAL
YOU
TAKE
NO
RISK

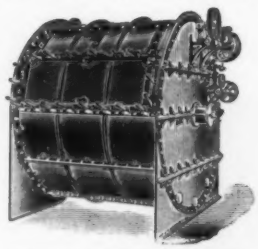


SKEIN AND SLUBBING MACHINE.

THE KLAUDER-WELDON DYEING MACHINE COMPANY

P. O. Box K, AMSTERDAM, N. Y.

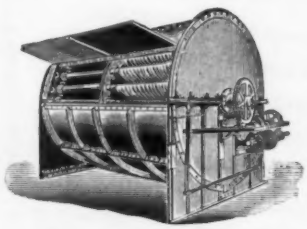
Machines for Dyeing, Bleaching and Scouring Woolen, Worsted, Cotton and Silk Skeins—Slubbing—Raw Cotton and Wool, Waste, Rags, Shoddy, Hosiery, Underwear, Hats, Caps, Knit Cloth, Tapes, etc.



SULPHUR HOSIERY MACHINE.

Special Machines for Sulphur Colors

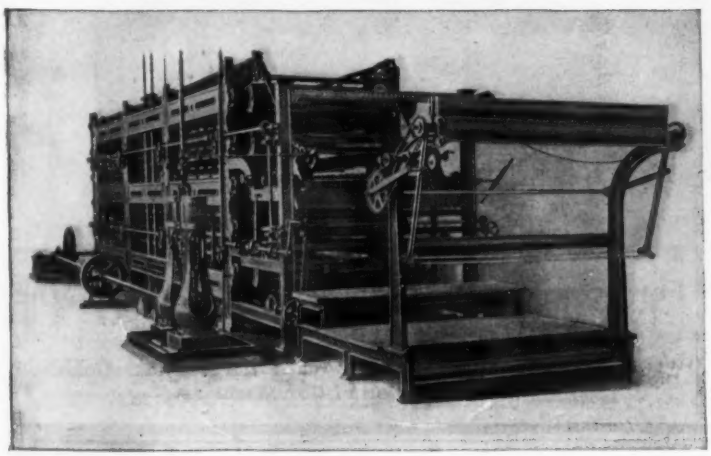
WILL EARN THEIR COST IN
LABOR ALONE
IN FROM
6 TO 12 MONTHS
ACCORDING TO CAPACITY



SULPHUR SKEIN MACHINE.

TENTERING AND DRYING MACHINES

WITH LOW DOWN FEED. **PATENTED FEBRUARY 26, 1895.**



Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.

Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs (Double or Single), Dewing Machines, etc. Crabbing Machines for worsted. Made either single, double or triple.

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WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
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Rotary Fulling Mills.
Rotary Cloth Washers.
Rotary Knit Goods Washers.
Combined R'y Fulling Mill and Washer for Knit Goods.
Endless Felt R'y Washers and Rotary Felling Mills.
Hammer Falling Stocks.
Dolly Washers.
Crank Fulling Mills.
Crank Knit Goods Washers.
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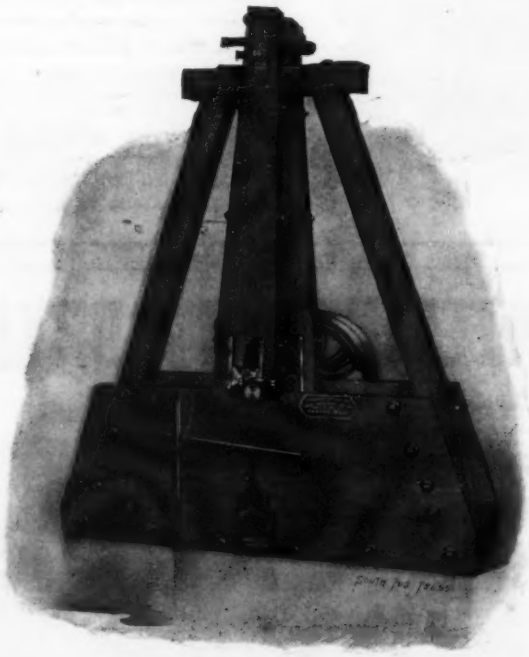
Carbonizing Machines.
Bleaching Machines for Chloride of Lime and Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

PUSHER OR CRANK

Fulling Mill and Washer



For Scouring and Fulling Knit Goods in the Garment.

Write for our Special Circulars with Large Illustrations and Full Description of Our Machines.

Boston Office,
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Telephone No. 1522.

Main Office and Works,
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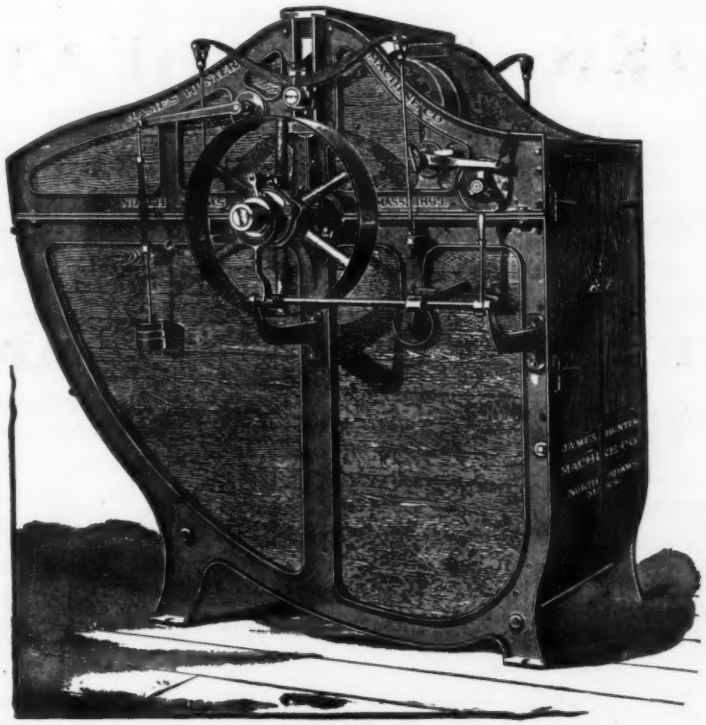
Automatic Wool Washers

PARALLEL RAKE

The "STONE DRYER," for Wool, Cotton, Rags, Etc.

CARBONIZING MACHINERY, ETC.



Fulling Mills, Cloth Washers,

WOOL OPENERS, SELF FEEDS, DUSTERS

JAMES HUNTER MACHINE COMPANY, NORTH ADAMS, MASS.

WILSON & CO., BARNSLEY, Limited

BARNSLEY, ENGLAND.

Absolutely secure combination of Shield and Bobbin guaranteed.

Loose Shields Impossible.

Specialties: PATENT "LOCKFAST" and "CLIMAX" Shields. ENAMELLED CONDITIONING BOBBINS, Impervious to Steam, Moisture or Oil.

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GOLD MEDAL St. Louis, 1904. DIPLOMA d'Honneur Liege, 1905. Highest Awards for Bobbins.

Added Strength and Absolute Security.

Samples and Prices on Application.

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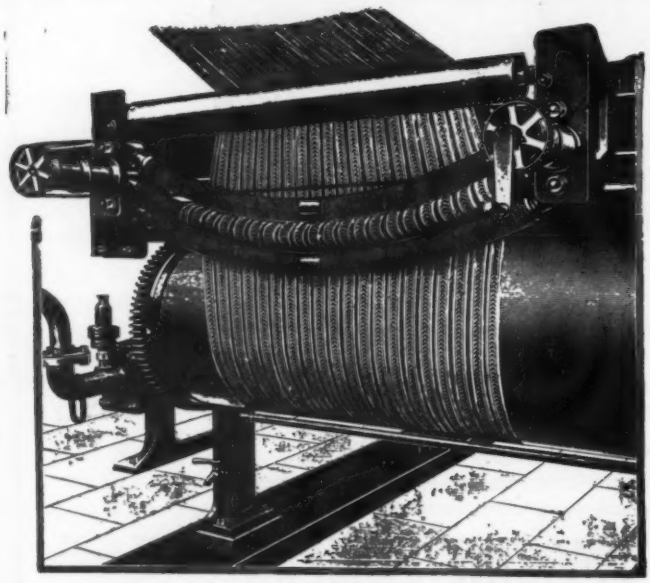
FOSTER SUPERHEATERS

Increase Efficiency and Reduce Cost of Operation.

Power Specialty Company,

BOSTON: 10 Post Office Square. **NEW YORK: 111 Broadway**

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

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Sole Agents for the United States and Canada.

INCREASE YOUR STOCK SPACE 1/3

By Handling Your Cases With

Economy Steel Tiering Machines

Also Saves
TIME,
LABOR and
Damaged Stock

Write for Descriptive Pamphlet Today.

Economy Engineering Company,
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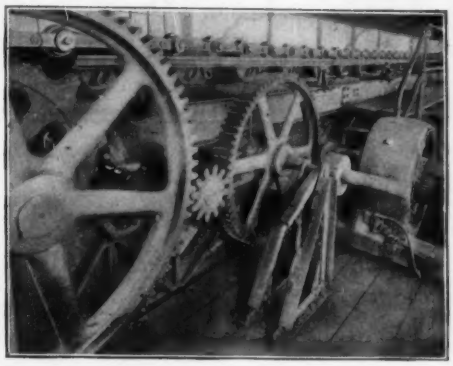
CONVEYING AND COAL HANDLING MACHINERY



Cable Railways — Industrial Railways
Hoisting Engines — Gravity Railways
"Grab" Buckets — Coal Crushers

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MONONGAHELA MANUFACTURING COMPANY,
New York Office, 120 Liberty St.
Monongahela, Pa.

Patented in the United States and Foreign Countries.

SEND FOR BOOKLET.

The American
WROUGHT STEEL
PULLEY

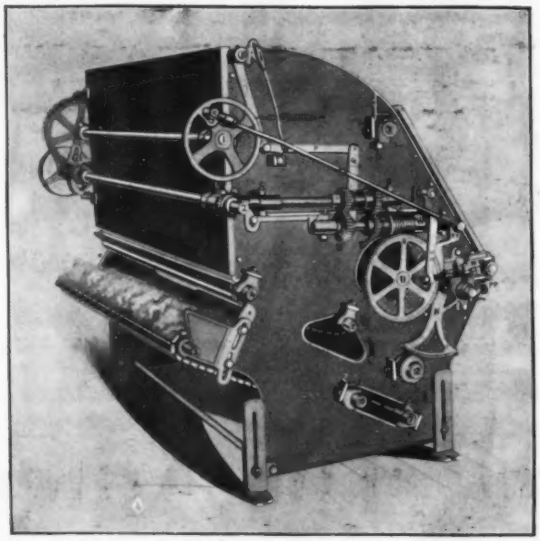
Is a parting PULLEY and can be applied without stripping the shaft.
It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly — keys and set-screws superfluous.
Interchangeable metal Bushings to fit shafts of different sizes.
Particularly adapted to TEXTILE manufacturing.

Sold by the Leading Supply Houses all over the WORLD.

The American Pulley Co.,

29th and Bristol Streets, : : PHILADELPHIA, PA.

THE FISHER PATENT CARD FEED



Write Us For List of Mills Where Machines Are Used.

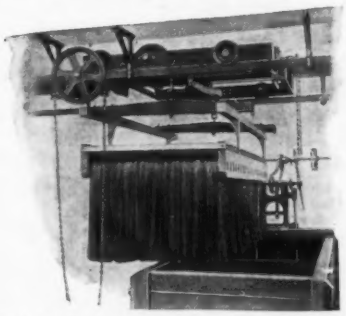
Woonsocket Machine and Press Company

WOONSOCKET, R. I.

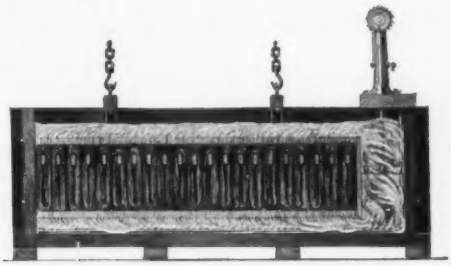
The Hussong Dyeing Machine

Patented Nov 6, 1900. April 9, 1901. Nov. 29, 1904.

THE ONLY MACHINE THAT WILL DYE SUPHUR BLACK SUCCESSFULLY.



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor, Makes No Waste Whatever, No Friction on the Material.
Requires but Little Power to Operate.
Leaves the Yarn and Slubbing it its Natural Condition.

Built by the **American Dyeing Machine Co.** Office 609 Pearl St., Camden, N. J.

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AITON MACHINE CO.

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Manufacturers of

Cabling and Insulating Machinery

VACUUM DRYING APPARATUS

Rubber Machinery, Including Calenders, Washers, Mixers, etc.

Hydraulic Machinery

Builders of Heavy Machinery. High Grade and Large Castings a Specialty.

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WILLIAM FIRTH CO.

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ASA LEES & CO., Limited,

TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

SOLE AGENTS FOR

JOSEPH STUBBS, Gassing, Winding and Reeling Machinery for Cotton, Worsted and Silk

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GEORGE ORME & CO'S Patent Hank Indicators, etc.

JAMES YATES & SON, Hardened and Tempered Steel Card Clothing for Woolen and Worsted Cards.

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R. CENTNER FILS, Heddles.

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BRADFORD STEEL PIN CO., Comber Pins.

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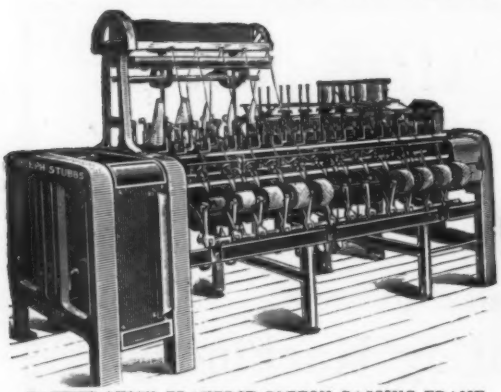
COTTON CORD AND VELVET CUTTING MACHINE CO., Corduroy Cutting Machines, etc.

PICK GLASSES, LEATHER APRONS, PATENT WIRE CHAIN APRONS.

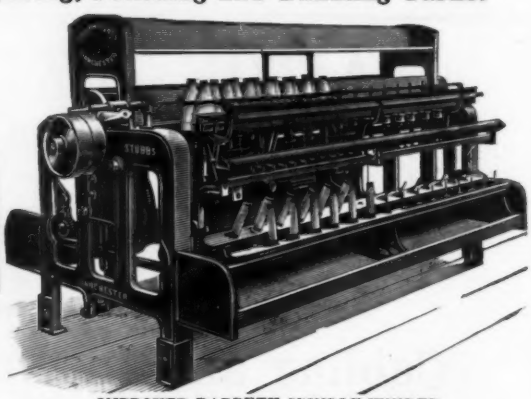
JOSEPH STUBBS - - Manchester, England.

SPECIAL MACHINERY

For Winding, Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

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Dobbins' Hard Water Soap, a Specific for Hard Water or Water Charged with Chemicals.

AMMONIATED POTASH SALTS FOR SCOURING.

Dobbins' Palm Oil Fulling Soap. Dobbins' "Fast Black" Soap. Pure Olive Oil Potash Soaps.

FREE SAMPLE SENT FOR TRIAL ON REQUEST.

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AMERICAN MOISTENING COMPANY

79 Milk Street, Boston, Mass.

Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

"Simplicity and Originality of Design."

Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

J. S. COTHRAN, Southern Representative, Empire Bldg., **ATLANTA, GA.**

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NEW FEATURES; Wearing Parts, Valve and Seat Renewable.

Class A Return Trap

We manufacture Steam Traps for all duties, High and Low Pressures, returning the Condensation back into Boiler or Discharging to Hot Well, Tank, or Atmosphere.

No Elastic Gaskets, all Joints Ground Metal and Metal.

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ALBANY, N. Y.

Established 1870.

FRED'K TOWNSEND, Pres. JAMES H. BLESSING, Gen. Mgr.

Eureka Fire Hose

THE BEST FIRE HOSE MADE.

(Trade Mark.)

For use in

Cotton Mills, Woolen Mills and Factories.

Seamless Woven and Rubber lined EUREKA COTTON HOSE, has no equal. Send for circular and testimonials.

Awarded Gold Medal at the St. Louis Exposition, 1904.

EUREKA FIRE HOSE CO.

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DINSMORE

Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

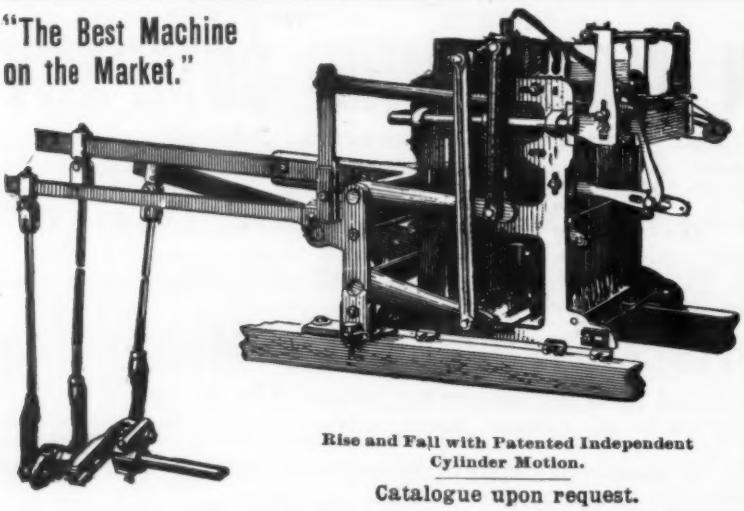
It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

DINSMORE MANUFACTURING CO.,

Salem, Mass., U. S. A.

"The Best Machine on the Market."



Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

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HALTON JACQUARD

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder,

THOMAS HALTON'S SONS,

Allegheny Avenue and C Street,

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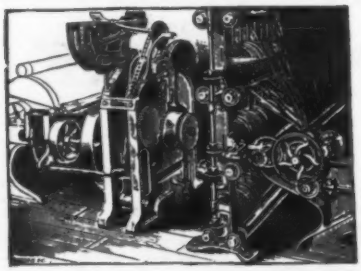

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HARRISON, N. J.

TORRANCE PATENT AUTOMATIC BALLING MACHINE

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

Write for particulars.

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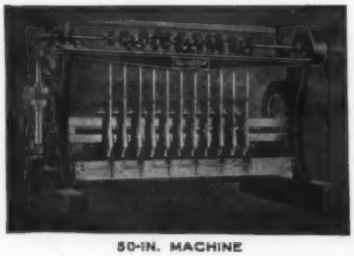
NEW ENGLAND DEPARTMENT
101 MILK STREET,
BOSTON, MASS.

C. E. ROBERTS, Manager. W. H. ALLEN, Ass't Manager.

STEAM USERS of this country have upwards of 90,000 Steam Boilers under the inspection and insurance supervision of this company.



50-IN. MACHINE

L. F. FALES

MANUFACTURER AND BUILDER OF

SEWING Machines MACHINES

FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

DESIGNER OF SPECIAL MACHINERY | WALPOLE, MASS. U. S. A. | PAPER SLITTING MACHINES

The Metallic Drawing Roll Co.

INDIAN ORCHARD, MASS.

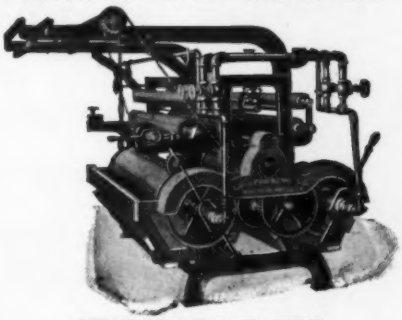
MANUFACTURERS OF

Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

WRITE FOR PARTICULARS.

WOOL BURRING and PICKING MACHINERY
CLOTH FINISHING MACHINERY



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For Preparing, Finishing Gills and Drawing Boxes
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"Coronation" Mill Sewing Machines.

Sews any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

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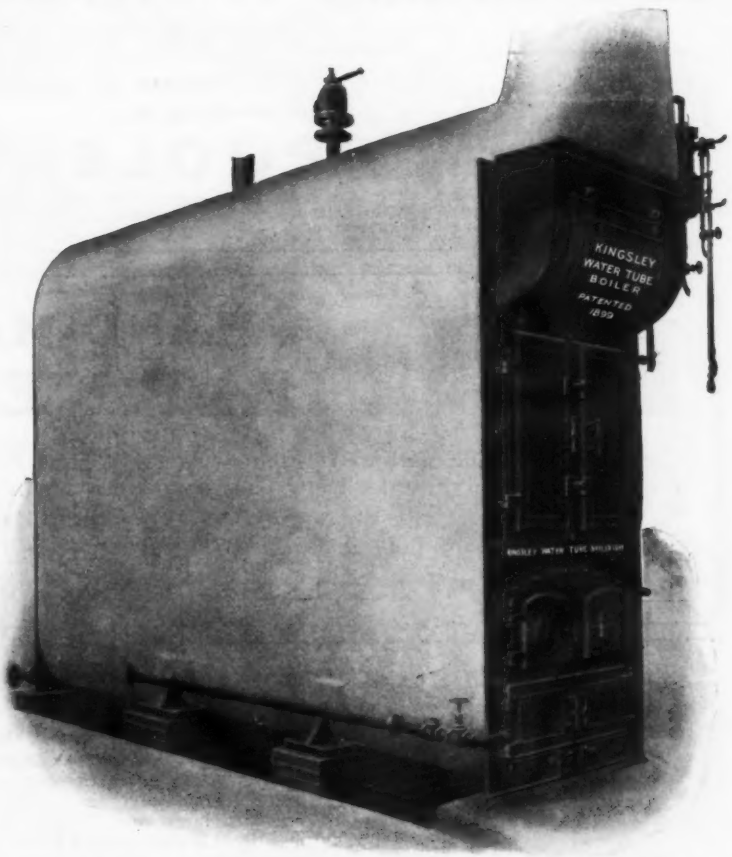

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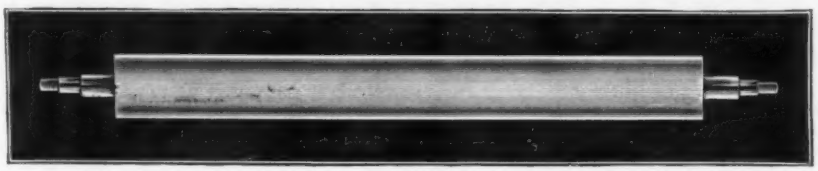

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Needs no covers,
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Builders of Improved
Cloth Tentering and Drying Machinery
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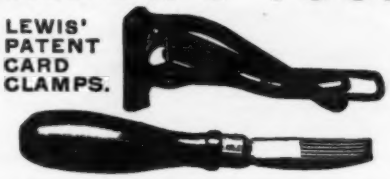
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Roving Spindles and Flyers a Specialty. Light Forgings.
REPAIRING OF ALL KINDS.

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Cleans Wool, Floors, Anything.

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Eight Thousand Sets in Operation in This Country and Europe.

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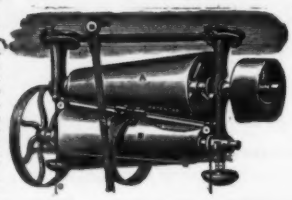

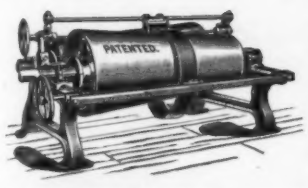

Smith & Winchester Co., So. Windham, Conn., 250 sets. Ferguson & McRae, Belfast, Ireland, 28 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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Without Wood Shoes.

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Today there are scores of Mills, large and small, either wholly equipped with **Lane Baskets** or adopting them as fast as others are worn out.

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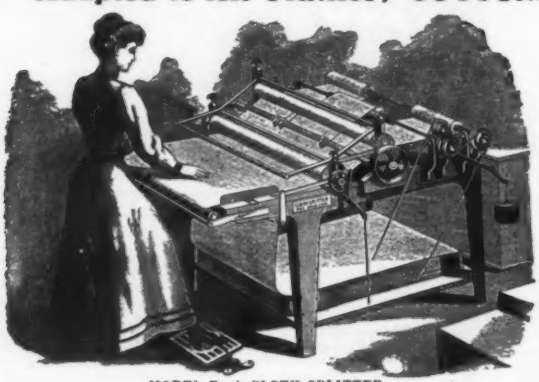
Adapted to All Textiles;—COTTONS, SILKS, LINENS, WOOLENS.



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Made by

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Every manufacturer has his own particular problems. If yours happen to be in any way related to Cloth Cutting, let me help you solve them. That is my business.

Perhaps your methods are perfect, perhaps not.

You can know all I know for the asking.

Very respectfully yours,

JAMES A. CAMERON.

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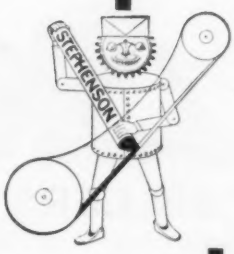
Among reliable Belt Manufacturers is to discourage the use of all liquids and when necessary apply a very thin coating of



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Bar Belt Dressing

Clean to handle—Easy to apply
Preserves belts—Prevents slipping

Samples speak louder than words

WRITE US FOR ONE

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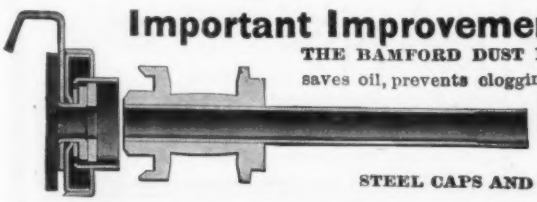

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THE BAMFORD DUST PROOF and SELF-LUBRICATING SPINDLE TUBE

saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, and most important of all, makes PERFECT YARN. Refer to largest worsted mills.

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STEEL CAPS AND SPINDLES. **Caps, Flyers, Tubes, etc., Repaired.**

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on a rawhide pinion corresponds to the Sterling mark on silver—it denotes the highest degree of perfection. New Process Raw Hide Pinions are the recognized standard of excellence. Owing to patent and secret processes of curing the raw hide, they contain much more of the vital fibre than other raw hide, and **wear like iron.** They provide a **noiseless positive drive**—no noise, no loss of power. Get our free booklet for the facts.

We also make accurately cut and planed Metal Gears, in Spurs, Bevels, Internals and Racks.

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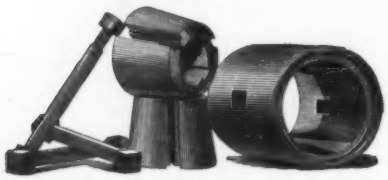

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has a way of holding shafts together, that no other COUPLING can equal.

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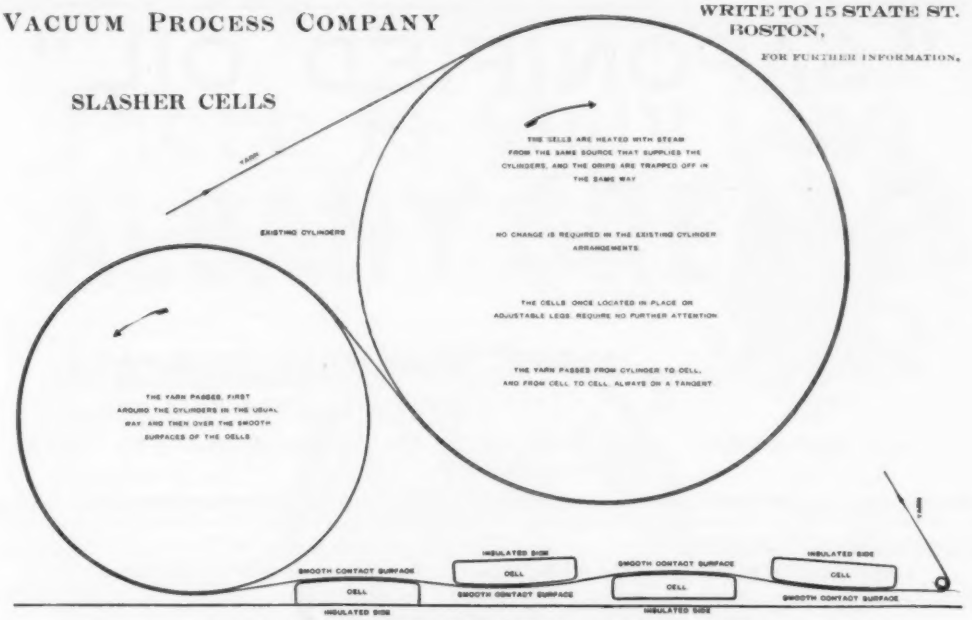
EXISTING CYLINDERS
THE YARN PASSES FIRST AROUND THE CYLINDERS IN THE USUAL WAY, AND THEN OVER THE SMOOTH SURFACES OF THE CELLS
THE CELLS ARE HEATED WITH STEAM FROM THE SAME SOURCE THAT SUPPLIES THE CYLINDERS, AND THE DRIPS ARE TRAPPED OFF IN THE SAME WAY
NO CHANGE IS REQUIRED IN THE EXISTING CYLINDER ARRANGEMENTS
THE CELLS ONCE LOCATED IN PLACE OR ADJUSTABLE LEGS REQUIRE NO FURTHER ATTENTION
THE YARN PASSES FROM CYLINDER TO CELL, AND FROM CELL TO CELL, ALWAYS ON A TANGENT
SMOOTH CONTACT SURFACE
CELL
INSULATED SIDE
INSULATED SIDE
SMOOTH CONTACT SURFACE
CELL
INSULATED SIDE
SMOOTH CONTACT SURFACE
CELL
INSULATED SIDE
SMOOTH CONTACT SURFACE

THIS DIAGRAM SHOWS HOW A SET OF FOUR CELLS IS APPLIED UNDER AN ORDINARY SLASHER WITH FIVE AND SEVEN FOOT CYLINDERS.
THESE CELLS ADD 21 PER CENT TO THE EFFECTIVE CONTACT OF THE CYLINDERS AND PERMIT INCREASING THE PRODUCTION OF THE SLASHER TO ABOUT THE SAME EXTENT,—A MINIMUM INCREASE OF 15 PER CENT BEING GUARANTEED. NO EXTRA FLOOR SPACE OR LABOR IS REQUIRED.

Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

Also Manufacturers of

HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

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SOFT WATER

There is no excuse for producing Goods *inferior in* Color, Texture *or* Quality *just because a natural supply of* Pure, Clear, Soft Water *is not provided.*

We can cheaply and effectually give a quality of water that will leave nothing to be desired. Scale and Corrosion *in* Boilers *will also be prevented.*

Let us place our Catalogue before you.

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Washing, Chemicking, Squeezing, Open Soapers, Sewing Machines, Scutchers and Angular Guides.

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(BRETON BRAND)

mixed with Red Oil gives smooth milky emulsion. As its base is Red Oil, it has the desirable features of scouring and fulling possessed by the same.

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HUMPHREY TURBINES, the best for low falls and economy of water.
McCORMICK TURBINES, for highest speed and power.

With the two, we are prepared to handle any proposition for the development or improvement of water powers.
We also manufacture

AUTOMATIC CLUTCHES, ROTARY FIRE PUMPS, AND MILL SUPPLIES OF ALL KINDS.

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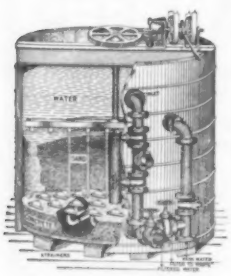
KEENE, N. H.



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An organization of experts in the various departments of water purification, giving especial attention to the engineering and chemical problems involved and offering its services as contractor to those wishing to install a water purification plant for any purpose with the assurance of obtaining maximum results and the most advanced ideas.

308 HARRISON BUILDING
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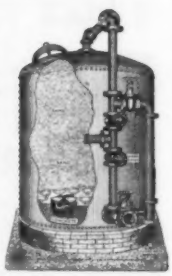

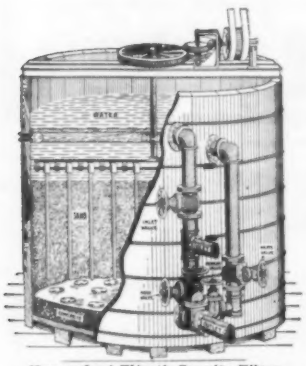

Hungerford-Elfreth Gravity Filter.

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FILTERS PRESSURE and GRAVITY

WATER SOFTENERS INTERMITTENT and CONTINUOUS

There is only one Filter, the

HUNGERFORD - ELFRETH,

the only filter which exceeds its guarantee.

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ALBANY GREASE

Regd U.S. Pat. Office

The Beginning

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A can of Albany Grease, with an Albany Grease Cup free of charge or expense for testing. The only information necessary to send is pipe connection in bearing, depth of oil hole from top of cap to journal, and give particular part of machinery on which the same is to be tested. Always send name of concern.

The Result

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Oct. 28, 1905.

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I used your Albany Grease on the turbines of the ONTARIO POWER COMPANY, Niagara Falls, Ontario, and not only on dry bearings but also for greasing the bearings on the regulating gates.

These bearings are under hydraulic pressure, and it is of very great importance that the right kind of grease is used.

I can assure you that your Albany Grease has given very satisfactory results, and with kind regards, I remain,

Yours very truly,
(Signed)
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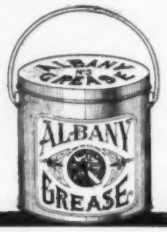

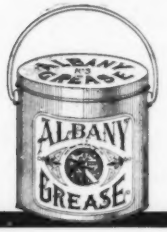

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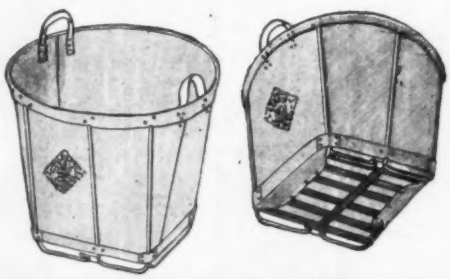

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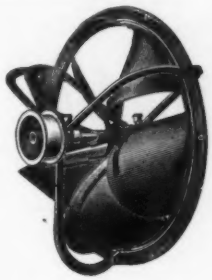

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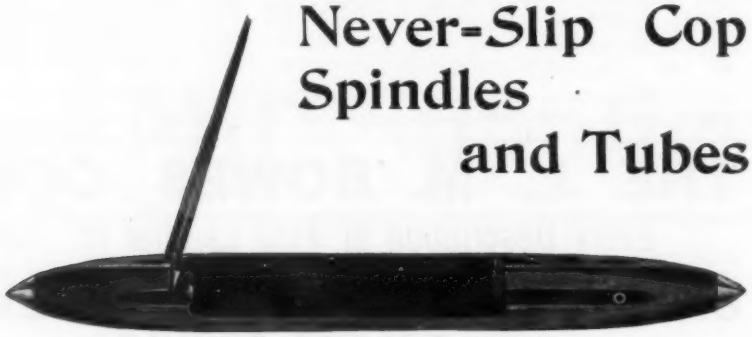
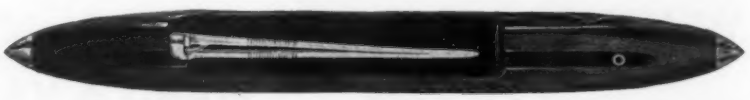


Shuttle with Spindle Raised

U. S. Patents; 778851, Jan. 3, 1905; 790611, May 23, 1905; other patents pending



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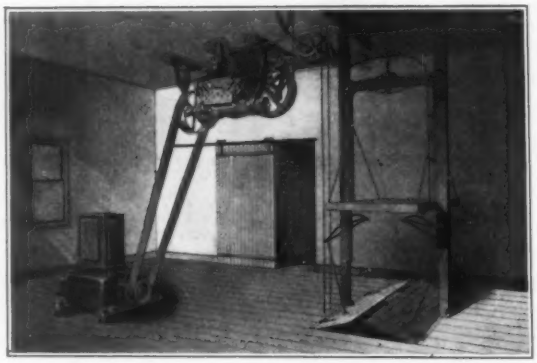

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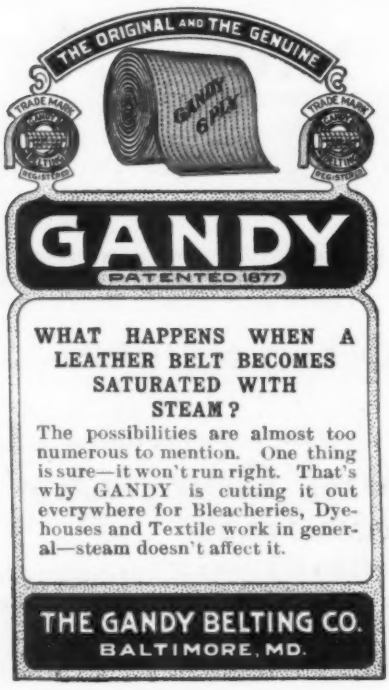
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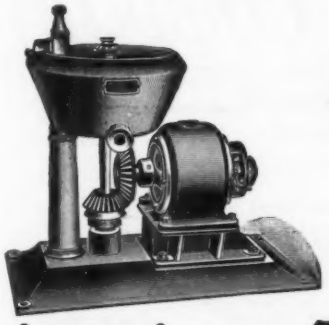

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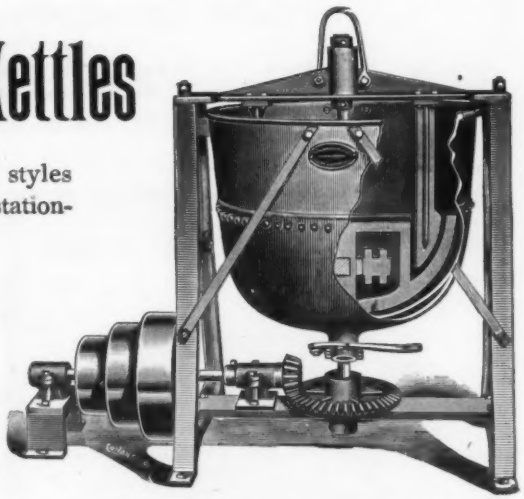

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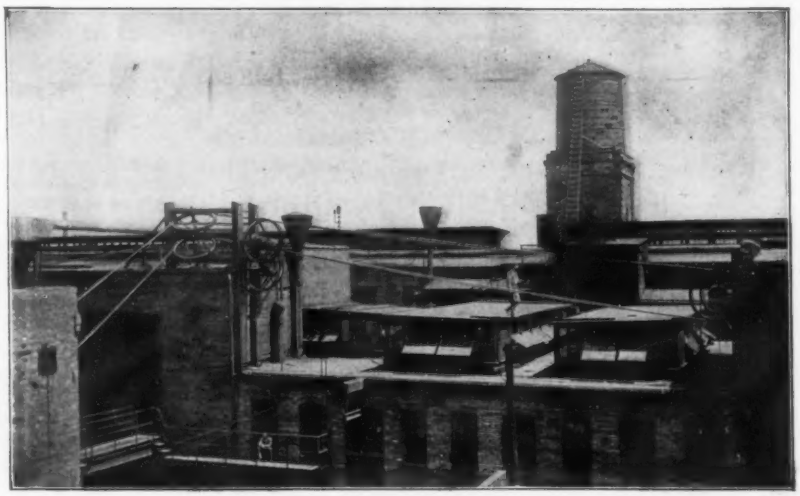

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PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers' names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

The Directory of the Knitting Trade in the United States and Canada

Is published early each year by LORD & NAGLE CO. It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendant and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $1.00.

PLAIN AND FANCY

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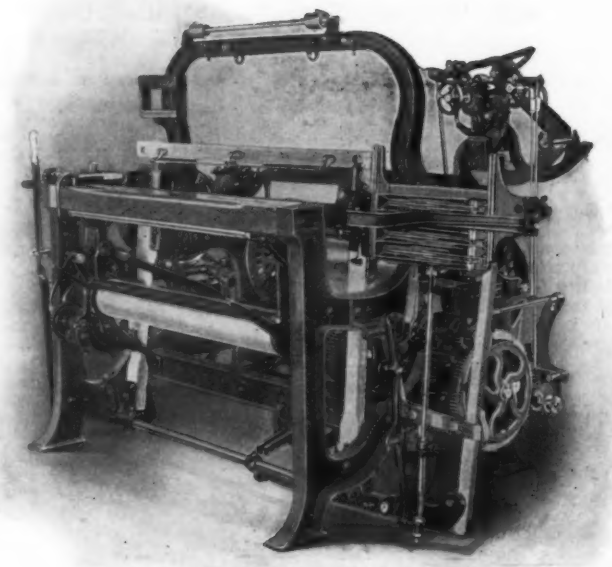

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Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

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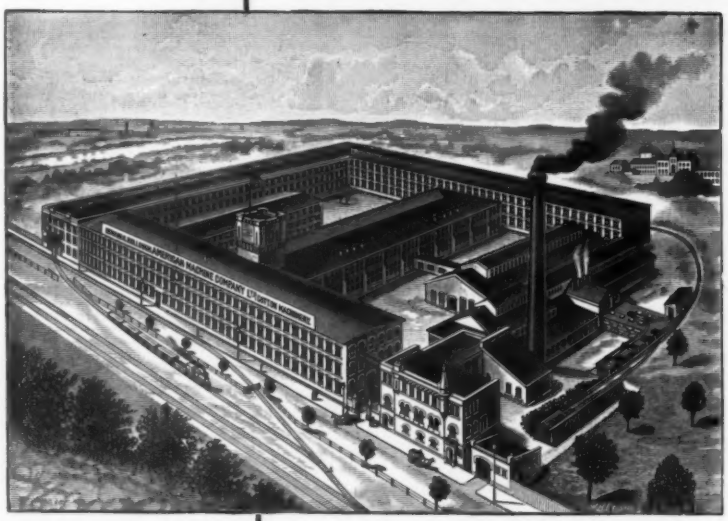

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TEXTILE WORLD RECORD

COMBINING

The Textile World and Textile Record.

VOL. 31. (NEW SERIES.) JUNE, 1906 No. 3.

Monthly Comment.

Textile Associations.

The frequency with which meetings of textile manufacturers' associations have been held recently has brought up the question whether there are not too many of these organizations. While this question has not been considered in any public meeting it has been freely discussed in the cotton and allied trades, and as far as we have been able to determine the prevaling opinion is in the affirmative, that there are too many textile associations and that a reduction of the number would be a benefit to the trade. Concerning the associations in general there is but one opinion, that they are of great benefit to the industry, but, it is argued, it is possible to have too much of a good thing. Associations may be multiplied until they become a burden instead of a benefit, and their power for good is lost by a dissipation of energy among a number of bodies, instead of concentrating it in one compact association, representing the whole trade.

This is the idea that is finding favor at the present time. As a general proposition it is irrefutable, but we believe that further consideration will show the conclusion to be unsound when applied to the textile industry and that the error arises from judging the whole by a part. The textile industry of the United States was classified by the census of 1900 according to cost of material used and value of products as follows:

	Cost of Material.	Value of Products.
Cotton Manufacture	$176,551,527	$339,200,320
Wool Manufacture	181,159,127	296,990,484
Silk Manufacture	62,406,665	107,256,258
Knit Goods	51,071,859	95,482,566
Flax, Hemp and Jute	32,197,885	47,601,607
Dyeing and Finishing	17,958,137	44,963,331
Total,	$447,546,540	$759,262,283

The last two divisions, "flax, hemp and jute," and "dyeing and finishing," by reason of their close connection with the other branches or because of their minor importance as single industries, may be left out of consideration in discussing the question of textile association. The other four branches of the textile industry are now served by five associations whose objects are national in their scope.

The American Cotton Manufacturers' Association.

The National Cotton Manufacturers' Association.

The National Wool Manufacturers' Association.

The National Association of Hosiery Manufacturers.

The Silk Association of America.

The cotton industry has two general associations; the wool, knit goods and silk industries each one. Comparing the number

of associations with the value of the products, in the first table it would seem as if cotton manufacturing with products valued at $339,200,320 was oversupplied with trade organizations as compared with wool manufacturing and its one general association. It is questionable, however, whether such comparison is fair. Wool manufacturing is far more concentrated than is cotton manufacturing in the United States, and distance is an important factor in many branches of association work. Especially is this the case in social intercourse and technical discussions, whose value in the development of manufacturing is unquestioned. With the industry covering distances measured in thousands of miles the subdivision of such association work becomes a necessity. In many other respects, however, united effort is the first requisite and the question of distance is eliminated. With the cotton industry distributed over such a vast area as it covers in the United States, it is almost certain that a concentration of association work in one organizaaion would entail some disadvantages.

There remains, nevertheless, the need of combination on the part of the entire industry for many important objects, and hence arises the necessity for a central association that, as occasion arises, is in position to act for the manufacturing interests of the whole country. There is no mistaking the trend away from local and toward general associations. It is seen in the recent change of the name to "National" by the New England Cotton Manufacturers' Association. The same tendency is shown in other countries, an example being found in the union of the manufacturers of Europe under the International Federation of Cotton Spinners and Manufacturers' Associations formed for united action where the interests of all run parallel, while leaving each association free to carry on its work as a local organization. Possibly the formation of this international federation may carry a valuable suggestion for the American cotton industry. Is it not possible to bring the "American" and the "National" together under a working agreement by which the industry may have the benefit of a central organization while the purely local interests of the trade may be left in the care of local divisions of the association? This would make it possible to reduce the number of meetings and at the same time carry on both local and general association work more efficiently than is possible at present with two organizations working on independent lines for the promotion of common interests. There are doubtless many difficulties to be met and overcome before such reorganization of association work is possible, but many of the obstacles are sentimental and will dissapear if the question is considered on broad national lines. The need of greater concentration of association energy exists only in the cotton industry. In the woolen, worsted and knit goods branches a different problem presents itself. In these industries a development of association work is required along the general lines that have been so successful in the cotton trade.

Artificial Silk.

Overproduction and the use of mercerized cotton are said to be largely responsible for the present depression in the artificial silk trade. Artificial silk is used principally for dress trimmings, manufacturers of broad silk having found it unsuitable for their purpose. It is said to lack the "cover" of natural silk, and to be too hard and wiry for dress fabrics.

One effect of the depression in the artificial silk industry is seen in the reduction of dividend by the Chardonnet Co. to 60 francs ($12) per share, as compared with 150 francs ($30) two years ago. The stock that was selling at 2,800 francs ($560) two years ago is now quoted at 670 francs ($134). In 1904 the profit was 6,400,000 francs ($1,280,000), of which 2,400,000 francs ($480,000) was required for dividends, as compared with a distribution of 960,000 francs ($192,000) this year. The business of the Chardonnet Co. has been very profitable, the company having earned in eight years an amount equal to three times the entire capital stock. These large profits led to the building of many mills, which have overstocked the market with goods. Another factor in the present situation is the fact that the Chardonnet patents expire in 1908.

How the Sliding Scale Slides.

In view of the request made by the Fall River cotton mill operatives to their employers for a restoration of wages to the rate prevailing previous to the reduction of 12½ per cent. in January, 1905, the following schedule showing the operation of the sliding scale since its adoption is of more than ordinary interest:

Week ending	Middling Uplands	28-inch 64×64	38½-inch 64×64	Margin	Wage premium above 18c per cut ¶
1905					
Oct. 27	10⅛	3½c	4⅞c.	.77	5
Nov. 3	10.8583	3½c	4.8958c	.757	3
10	11.61	3½c	5c	.714	0
17	11.28⅛	3½c	5c	.74	2
24	11.43⅛	3½c	5.041c	.735	1
Dec. 1	11.80	3½c	5.15c	.752	3
8	12.35⅝	3½c	5½c	.724	0
15	12 03⅛	3½c	5½c	.7502	3
22	12.19⅛	3½c	5½c	.7376	1
29	11.99	3½c	5½c	.7537	3
1906					
Jan. 5	11.86	3½c	5½c	.7641	4
12	11.76⅛	3.79166c	5½c	.7809	6
19	12.125	3.79166c	5½c	.7523	3
26	11.96⅛	3½c	5½c	.7556	3
Feb. 2	11.475	3½c	5½c	.7949	7
9	11.26⅜	3½c	5½c	.8116	9
16	11.23	3½c	5½c	.8145	9
23	10.99	3½c	5.2125c	.8275	10
Mar. 3	10.92½	3½c	5 3/16c	.8285	10
10	11.25⅛	3½c	5 1/8c	.8019	8
17	11.05⅛	3½c	5 5/32c	.8127	9
24	11.42½	3½c	5½c	.7782	5
31	11.72½	3½c	5½c	.7542	3
Apr. 7	11.63½	3⅝c	5½c	.76152	4
14	11.76⅜	3⅝c	5½c	.75016	3
21	11.80	3⅝c	5½c	.74819	2
28	11.70⅝	3⅝c	5½c	.75552	3
May 5	11.75	3⅝c	5½c	.7285	0
12	11.75	3⅝c	5½c	.714	0
19	11.96⅜	3⅝c	5½c	.7068	0
26	11.90⅝	3⅝c	5½c	.7114	0
Average premium for 31 weeks					3 44/100%

The reduction of 12½ per cent. last year brought wages in the cotton mills of Fall River to a basis of 17.32 cents per cut. In October the rate was increased 3.9 per cent. to 18 cents a cut at the time the sliding scale was established. This fixed increase was, consequently, 10.4 per cent. short of a restoration of the reduction of 1905. In asking for the 1904 rate of wages the operatives are asking for an advance of 10 per cent. above the present minimum rate, and the abandonment of the sliding scale plan. The average premium for the thirty-one weeks under the sliding scale has been 3.84 per cent. and at the present time (June 7) market conditions are such that the premium has disappeared entirely. This scale has never been popular with the operatives. It has introduced an element of uncertainty in the rate of wages, which the help have been unable to understand. Since its adoption their wages have been subject to frequent and wide fluctuations between 18 and 19.80 cents per cut. Why should wages be based on 19.80 per cut for the two weeks ending March 3, and on 18 cents per cut for the two weeks ending the first of the following June? This is the question that the operatives are asking, and to which they have received no satisfying answer.

The reduction from 19.80 to 18 cents was due to an increase in the New York quotation for middling uplands from 11 to 12 cents, and a reduction in the quoted price of print cloth from 5 3/16 to 5 1/8 cents. The manufacturers point to these changes as causing a reduction of the margin of profits, but to this contention the operatives reply that a rise in the price of cotton does not mean an increase of cost unless the manufacturers buy cotton at the higher price, and that neither does a reduction of 1/16 of a cent a yard mean smaller proceeds from sales unless goods are sold at the lower price.

The operatives contend that the mills have been stocked with cotton so as to make it unnecessary to buy at the higher quotations, and that a large part of the finished product of the mills in which they work consists of fabrics other than print cloth, and that the price of these goods is in no way regulated by the quoted price of print cloth. The gist of the operatives' contentions is that under the sliding scale their wages are arbitrarily changed from week to week to conform to market fluctuations that do not affect the profits of their employers and have no connection with their own wages. Hence their demand for a fixed wage scale. While one of the points raised by the operatives is that the operation of the sliding scale is not profit sharing there is no request made by them for any modification of the scale to bring about a division of the profits of manufacturing between mill owners and employees. The demand by the help for a fixed

scale is based in the broad assumption that the price of their labor, like the price of cotton and of print cloth, should be regulated finally by the law of supply and demand, and that there is no more reason for regulating the price of labor by a scale based on the price of cotton and cotton goods than there is for regulating the price of cotton and cotton goods by a scale based on the price of labor.

The negotiations between the manufacturers and their operatives are now in progress and while differences of opinion have been disclosed it is the general belief that an amicable settlement will be reached.

Numbering Sewing Thread.

A correspondent recently asked for information regarding the system of numbering cotton sewing thread, and our efforts to answer his question have disclosed the fact that there is no established thread standard. Apparently each manufacturer follows a plan of his own in numbering his thread, except when a customer calls for another thread manufacturer's number. Our correspondent's question and the letters received by us from a number of thread manufacturers appear in the Question and Answer Department of this issue. They show unmistakably the need of an established standard.

Inasmuch as the numbers adopted by the thread manufacturers, when not wholly arbitrary, are variations of the 840-yard cotton yarn standard, we suggest that buyers of cotton thread could contribute to the adoption of a thread standard by insisting that the sizes of the thread they buy be indicated either by the number of 840-yard lengths per pound or by the number of yards per pound.

One of our correspondents, a man of long experience in the thread trade, states that in recent years thread manufacturers have frequently changed their system of numbering the sizes of their product. This is a wholly indefensible practice. Buyers of thread, as of all other kinds of merchandise, have a right to know what they are buying and what price they are paying for it. This is possible only when a standard is established and understood by both seller and buyer. The conditions in the thread trade correspond to those that would prevail in the cloth trade if every cloth manufacturer were accustomed to change the length of his yardstick without giving notice to the buyer.

A Conditioning House.

The practice of wetting Chinese cotton to increase the weight has led to a loud outcry from buyers in China and Japan, who claim that this method of cheating is one of the principal reasons why a large quantity of Chinese cotton is not sold for export. They have presented a petition to the governor at Shanghai, asking that a conditioning house be established at that place and so enable the trade to determine the amount of moisture in cotton offered for sale.

The conditioning house at Kobe, Japan, established several years ago, has been of great advantage to the trade, and afforded means for settling disputes between buyer and seller. The Chinese petitioners have asked that the Kobe establishment be taken as a model for the Shanghai conditioning house.

The Cotton Supply for Lancashire.

The story of prosperity in the English cotton trade is told by the following summary of recent returns by thirteen incorporated companies:

9 firms average 10 per cent.
1 firm averages 11 per cent.
2 firms average 13⅓ per cent.
1 firm averages 20 per cent.

These figures represent fairly the reports of cotton corporations. There is, of course, no means of determining the profits made by the private firms, but it is reported that because of more economical management their results are even more gratifying than in the case of the limited liability companies. Lancashire spinners and manufacturers, however, are not allowing themselves to be lured into a sense of false security because of the present prosperity. They know that this prosperity can be quickly changed to adversity by a shortage of raw material. It is difficult for Americans to realize how impor-

tant cotton manufacturing is in the industrial and social system of Great Britain. Some idea of this importance is obtained from the following figures recently furnished by J. H. Hutton, of the British Cotton Growing Association:

Capital invested	$1,920,000,000
Value of products	552,000,000
Cost of raw material	216,000,000
Difference between values of raw material and finished goods	336,000,000

These figures relate directly to cotton manufacturing. The real importance of the industry can be estimated only by taking into account the support it gives to other trades and professions. It has been estimated that 10,000,000 people, or one-quarter of the population of Great Britain are dependent on the cotton trade for support. These facts account for the deep concern felt by the English people and the ruling classes in the question of an adequate supply of cotton. A deputation representing the Lancashire cotton trade recently waited upon the prime minister, Sir Henry Campbell-Bannerman to ask for assistance from the government in promoting cotton raising in the colonies. At this meeting special stress was laid on the advantages offered by Northern Nigeria for the growing of cotton. The great need, it was stated, was a railroad to transport the cotton from the interior to the coast. It is this railway that the petitioners wanted the government to build. The case was thus stated at the hearing:

J. A. Hutton:—The Association had made inquiries all over the world in their search for new sources of supply, and they had come to the conclusion that they must have a country capable of producing millions of bales to take the place of or supplement the American supply, and that in North Nigeria alone lay the only possible salvation for the cotton trade. But here they were brought up at once against the fact that North Nigeria was for all practical purposes inaccessible. It was no use getting the natives to grow cotton unless it could be brought to this country, and at present that was impossible. Therefore they came to the Government to point out that if they were to do any good in North Nigeria means of transport must be provided. As an illustration of the difficulty of transport, the Association started a ginnery in February of last year, but they were now informed that the cotton could not be brought down until the river rose. If the country was to be reached a railway must be made. The colonies of Lagos, South Nigeria, and North Nigeria had no funds, and if a railway was to be made it must be with Imperial assistance. Mr. Hutton referred to various precedents, and also urged the stategic value of a line to North Nigeria. The peoole of Lancashire, he assured the Prime Minister, would regard with feelings almost of reverence the Government which did this great service for their staple industry.

Sir Alfred Jones, president of the Association, spoke very hopefully of the work that had been done on the West coast of Africa, from which they were now getting £150,000 worth of cotton every year. It was important, he said, that they should keep faith with the natives. Once having encouraged them to grow cotton it would set back the industry a hundred years if they failed to buy the cotton from them. Sir Alfred also spoke hopefully of the West Indies, which had produced cotton this year of the value of from £100,000 to £130,000. The thing was going to be an enormous success in the West Indies, and as for North Nigeria—"well, you will really have to make that railway, you know."

Sir W. H. Houldsworth:—While this was primarily a Lancashire question it more or less affected all the industries of the country.

Mr. Shackleton, M. P.:—The cotton operatives of Lancashire had come to the conclusion that the only way to prevent a recurrence of the suffering which they had lately experienced in Lancashire was to give the speculator plenty of stuff to speculate with. If the Government could help them the Lancashire operatives would always hold this day in grateful remembrance.

The premier's reply, while sympathetic, indicated plainly the conviction that the main reliance for an increased supply of cotton must rest upon private and not public effort. The government, he stated, was with them on this question, but it was impossible to make definite promises of assistance. About the time this hearing was held the delegation that recently visited the United States, reached England, and gave the following account of their trip to the Guardian:

Both English and Americans, Mr. Macalister said, treated us more than hospitably. Before beginning their inquiries the Commission had the pleasure of spending a few hours in Washington and shaking hands with President Roosevelt.

We visited, Mr. Macalister continued, a great many plantations, and got a good deal of information, which we shall place before the persons who sent us out.

Questioned as to his views of the cotton crop, Mr. Macalister said the reports up to the time he left America were very satisfactory as to the stand that the crop had made. "As to the future," he said, "it is only a question of labor. There is abundant scope for cotton planting, and in my judgment cotton can be grown on a far larger scale than it now is and yield a handsome profit to the grower. If you can get labor in sufficient quantity,

and of course of the right quality, America can and will grow fifteen, twenty—aye, even thirty millions of bales. The people best suited for cotton cultivation are those who have had some experience of farming. White labor is the best. It is found that when a company of white men settle down to cotton-growing the negro betakes himself to a humbler kind of cotton work at another place. The climate is good. When we were there we had a plentiful supply of strawberries and other fruits, and the air, although warm, was not heavy."

Mr. Macalister is convinced that there is a fine opening for honest and industrious people in the smaller American towns, and not least of all in the cotton-growing localities. One of the reasons, he thinks, why American capitalists have not given more serious attention to the question of cotton supply is their haste to get rich. Many of them have not the patience to amass wealth slowly but surely.

Mr. Orr confirmed the opinions expressed by Mr. Macalister. The visit has impressed him very much. Whatever may be said about cotton-growing in our colonial possessions (and it was most desirable that this should be extended as fully as possible, he said), he was glad to find that the possibilities of increasing the supply of cotton from what we have regarded as its natural place of growth are so good. "We visited hundreds of cotton plantations," he said, "and found that the conditions of growing are such that if more land is taken up there is still much money to be made out of cotton-growing there. Trade is prosperous and has been for the last few years. Planters who suffered a few years ago seem now to be making heaps of money. Ten cent cotton is good enough for anybody."

In an interview with a representative of the Manchester Guardian Mr. Macalister was good enough to give an account of his journey and the impression he had formed. They left Liverpool, he said, on the Saxonia and sailed to Boston, where they were met by New England representative of the American textile industry, one of whom, Mr. J. R. MacColl, president of the New England Manufacturers' Association, accompanied them in their journey southward. By the assistance of Sir Edward Grey, Foreign Secretary, instructions had been sent to His Majesty's Ambassador at Washington and to the British Consuls in the South to afford the Commission every assistance. Wherever they went they were received with the utmost kindness.

There are millions of acres ready for cultivation. The only lion in the way is the labor difficulty. We met many English people down South, and they appeared to be well satisfied. There is room there for much of the surplus labor of North America and of our own country, chiefly of course of the agricultural or farming class. You can start clearing land in November and plant your cotton in the following March.

"You ask me about the means of transport to the coast. There is no difficulty on that score. The railway companies are only too anxious to develop the country, and are ready to do anything they can to induce people to go out there and grow cotton."

To sum up, the Commission have gained a great deal of information which will be of the very greatest service to the Lancashire cotton industry. With the due employment of capital and labor they think there need be no shortage of the cotton supply. The problem, therefore, is to get the capital and labor there. These are points which will be considered in the near future, and of course the members of the Commission will lay them more fully before the firms who have joined in arranging the visit. The Commission will prepare a full report in due course, and this will deal with the question of utilizing the land which is still open for cultivation in the Southern States, as to which they think the prospects are favorable.

The contrast between the petition of the British Cotton Growing Association and the report of the visitors to the United States cannot fail to impress the British Government. There is plenty of uncultivated land in both the United States and Nigeria. That, however, is as far as the conditions run parallel. Here the climate and soil are the best; there both climate and soil are known to be inferior. Here the country is spanned with a network of railways, making transportation rapid and cheap; there the country is without transportation facilities, while conditions are such that no private capital could be obtained to build them. In Nigeria there may be a large population, but all reports agree that it cannot be relied on to supply the labor necessary for cotton raising, while the importation of laborers is an impossibility; in the United States the demand for labor is in excess of the supply, this being the principal obstacle to an increase of the cotton crop. This review of the conditions in Nigeria and the United States shows plainly the remedy for the cotton shortage. It is to increase the supply of labor in the United States. Instead of urging the British government to build railways into the wilds of Africa, the British Cotton Growing Association could direct energies to better advantage by sending desirable working people to our Southern States.

The Woolen Industry in Australia.

Some months ago the failure of a woolen mill at Footscray, Victoria, was announced and the cause assigned was the reduction in the Australian tariff a short time before and the high wages paid the operatives. As the development of woolen manufacturing in the greatest wool producing country of the

world is a matter of general interest we wrote to the well-known firm of wool dealers of Melbourne, Goldsbrough, Mort & Co., for information regarding the present state of woolen manufacturing in Australia and received the following reply:

"Referring to your letter of 18th January, we beg to enclose you herewith three tables showing the number of woolen mills in Australia, number of persons employed, and the amount of raw material used, and which we hope will be of some use to you.

"As to the woolen mill at Footscray that failed, it is not a new mill, and we are unable to ascribe it to the Australian tariff, or the increase of wages, as several other mills on the same footing are doing well."

WOOLEN MILLS IN THE STATES COMPRISING THE COMMONWEALTH OF AUSTRALIA AND NEW ZEALAND—1904.

State	Number of Mills	Horse Power of Engines used	Months in operation per year	Value of Machinery and Plant	Land, Buildings and Improvements	Total Value
Victoria	10	1,719	11.6	$1,031,709.96	$459,570.58	$1,491,480.54
New South Wales	3	305	12.0	152,693.54	*—	*—
Queensland	1	50	*—	119,084.58	55,890	174,974.58
Western Australia	—	—	*—	*—	*—	*—
South Australia	2	71	—	—	—	—
Tasmania	3	135	12.0	136,080	81,648	220,728
Total for Australia	19	82,280				
New Zealand	10	1,554	12.0	839,341.44	508,929.48	1,348,270.92

* No returns published.

PERSONS EMPLOYED IN WOOLEN MILLS, AND WAGES PAID—1904.

States	Number of Operatives.	Total Wages Paid	Average Weekly Wages
Victoria	1,224	$305,888.40	$4.80
New South Wales	245	62,470.44	4.80
Queensland	122	*—	—
South Australia	142	*—	—
Western Australia	—	—	—
Tasmania	201	32,989.68	2.12
Total for Australia	1,934		
New Zealand	1,693	536,324.86	6.24

* No returns published.

WOOL AND COTTON USED IN MANUFACTORIES—1904.

State	Wool Used, and Cost Lbs. greasy	Price per lb.	Total	Cotton Used, and Cost Lbs.	Price per lb.	Total
Victoria	4,027,080	24c.	$966,499.20	211,256	†—	†—
New South Wales	370,868	*36c.	133,512.48	†—	†—	†—
Queensland	92,901	22c.	20,438.22	†—	†—	†—
South Australia	†—	†—	†—	†—	†—	†—
Western Australia	†—	†—	†—	†—	†—	†—
Tasmania	840,500	19c.	159,695	†—	†—	†—
Total for Australia	5,331,349		1,280,144.90	†—	†—	†—
New Zealand	5,191,451	15½c.	804,674.80	†—	†—	†—

* Mostly scoured.
† No returns published.

The Australian mills depend entirely on the home market. The high wages prevent their competing with European mills and it is not likely that we shall see any development of woolen manufacturing in Australia that will seriously affect production in other countries. The cost of transporting wool from the Australian sheep ranches to European woolen and worsted mills is a trifling item in the cost of woolen goods when compared with the lower wages paid in Europe for skilled labor.

The Baling and Shipment of American Cotton.

In another part of this issue will be found an interesting letter from W. W. Campbell, agent of the Pacific Mail Steamship Co., at Kobe, Japan, in which he calls attention to the way in which American cotton is neglected in transit to the mills. During the last two years these conditions have been more serious in Japan owing to the war, which deprived the transportation companies of the coolie labor with which to take care of the cotton. The cotton was left out of doors, exposed to all kinds of weather, and as a result was saturated with water. One of the pictures that Mr. Campbell sends us shows mushrooms growing on a bale of cotton. He calls attention to the heavy losses result-

ing to both shipper and consignee from these methods of handling.

There was an interesting discussion on the question of improving the methods of baling and handling American cotton at the recent Washington conference and although the faults that Mr. Campbell points out are due to inadequate facilities at the receiving points in Japan, yet conditions are no better in this country if indeed they are not worse. The question is beset with difficulties and the solution is not yet in sight.

The plan for manufacturers to engage in raising cotton may, if carried out, result in some improvement in the baling. Certainly it is inconceivable that manufacturers raising their own raw material would allow it to be handled as American cotton is now handled between the gin and the mill.

Trade-Marks in Cuba.

The Merchants' Association of New York has rendered an important service to owners of trade-marks by calling attention to the danger of confiscation under existing laws of Cuba. The situation is thus stated in a circular distributed by this association:

The merchants' Association has recently received a number of complaints from its members concerning the confiscation by citizens of Cuba of trade-marks that have been established by American citizens by years of use. We earnestly advise every member of the Association and all manufacturers having valuable trade-marks, immediately to take steps to secure the registration of those marks under the laws of the Cuban Republic so as to protect the marks for their exclusive use.

Under the Cuban laws regulating trade-marks, the mere act of registration of a trade-mark in the Island of Cuba gives absolute and exclusive right to the use of that trade-mark in the domains of the Cuban Republic to the party who has so registered the mark, to the exclusion of the rightful owner, priority of adoption and of use not being recognized as a basis of ownership in the slightest degree. The result of the operation of this law is that a citizen of Cuba may register any well established and valuable American trade-mark not already registered in the Island, and thus become the sole and exclusive owner of that trade-mark in the domains of the Cuban Republic without the knowledge or consent of the original American owner; and further, under the terms of the Cuban law, when the American manufacturer either directly, or through his distributers, endeavors to place his goods in the Island of Cuba, bearing this trade-mark originally owned by him, or when he continues to send goods into Cuba bearing such trade-mark, those goods are immediately subject to confiscation at the custom house, and the Cuban who has registered the trade-mark, even though without the owner's knowledge, has both a criminal and a civil action against the American owner for infringement. Many American manufacturers have already been subjected to blackmail on the part of irresponsible Cubans who have made a business of pirating and registering valuable American trade-marks for the sole purpose of demanding tribute from the American owners. These irresponsible Cubans have been conspicuously successful because of the possibilities afforded them by the existing state of the Cuban laws relative to the subject.

The character of the Cuban laws relative to trade-marks, and their consequent effect upon American manufacturers whose goods go into the Island of Cuba are in sharp contrast with the character of the trade-mark laws of the United States and with the effect of those laws upon Cuban goods which under trade-marks, come into the United States in large quantities. We are advised by Mr. Morse that under the laws of the United States Cubans owning valuable trade-marks are afforded two methods of relief—first by Statute Law; second, by Common Law,—both methods affording them greater advantages here than are afforded by the Cuban law to American trade-marks in Cuba.

Trade-mark laws of a character somewhat similar to those existing in Cuba, exist in certain other foreign countries, and we would suggest that the American owners of trade-marks give immediate consideration to the advisability of causing their marks to be registered in other foreign countries as well.

The Merchants' Association has taken this matter up with the Federal Government in the endeavor to have some action taken by the Government to induce the Cuban Republic to furnish that same degree of protection to our trademarks in the Island of Cuba as our laws give to Cuban trade-marks in the United States.

We therefore urgently ask all manufacturers who have had any difficulty in relation to their trade-marks in the Island of Cuba immediately to write to the Association, giving full particulars as to the nature of the difficulty and as to the means, if any, by which they regained control and right to the use of their trade-marks in the domains of the Cuban Republic. We should also be glad to receive any information concerning difficulties in relation to trade-marks in countries other than Cuba.

The Japanese Cotton Industry.

While prophecy is a fruitful and unnecessary source of error, and never more so than when the cotton industry is involved, there is little doubt that important changes will occur in the currents of the cotton trade during the next ten years. They are already taking place and the only uncertainty is as to how far they will modify existing conditions. Italy and Japan are the most prominent factors in this process of change at the present time, and in both countries the development now taking place is due to their large supply of cheap and efficient labor. A correspondent of the Manchester Guardian recently gave an interesting account of the Japanese cotton industry, in which he pointed out some of the advantages and defects of the Japanese system.

The alliance under the Anglo-Japanese treaty finds no parallel in industrial operations. The soldiers and sailors of Great Britain and Japan may stand ready to fight and die side by side in defense of a common cause, but this union finds no counterpart in the cotton industry. In this industrial field the Japanese face the Britons just as they faced the Russians in the recent war. The Japanese learned the trade of cotton manufacturing in England, but Englishmen are rigidly excluded from responsible positions in the Japanese mills. Japan for the Japanese is the motto, and while they are ready to receive instruction regarding machinery and processes, the work and oversight are intrusted to the Japanese alone. New mills are equipped with ring spinning machines exclusively, while the mules already installed are being gradually thrown out. Nearly all the machinery in Japanese cotton mills is British, nearly 80 per cent., it is stated, having been supplied by Platt Bros. & Co., of Oldham, but the Japanese machine builders have already begun to turn out warping and winding machines, reels, presses and looms, and are working on a ring spinning frame of native design, in which the best features of the English frames will be incorporated.

While the supply of labor is abundant, the Japanese are said to prefer the outdoor life to which they have been accustomed, and as a consequence their attendance at mill work has been rather uncertain. They are, however, rapidly adapting themselves to mill life. Most of the mills are run in two shifts of 11 and 12 hours, that is, 23 hours a day for seven days per week, and with few holidays. Children are employed in large numbers for both day and night work. The machinery is not stopped for meals. The help go outside in batches to eat, while their machines are operated as well as possible by the others left in the mill. Judged by American or English standards the wages of the operatives are extremely low, but the increased purchasing power of money in Japan makes the difference more apparent than real. Wages in the Fuji Cotton Spinning Co. are reported to be 28 to 32 cents a day for males, and 20 to 24 cents a day for females. Some of the children earn as little as 4 cents a day. The food of the operatives consists mainly of rice; they do not eat meat, nor drink intoxicating liquors They live in cheap houses that have no furniture and sleep on straw mats. The writer in the Guardian thinks these conditions will help the Japanese manufacturer to capture the Chinese trade, but that this commercial advantage will soon be lessened by the demand of the Japanese workers for higher wages.

There are in Japan at present forty-nine cotton mills with about 1,500,000 spindles, all built within the last thirty years, the development being greatest during the decade ending with 1902. The shortage and high prices of cotton during 1903 and 1904 caused heavy losses among Japanese cotton manufacturers, and resulted in consolidations of the smaller concerns, so that now the bulk of the Japanese industry is controlled by eight firms.

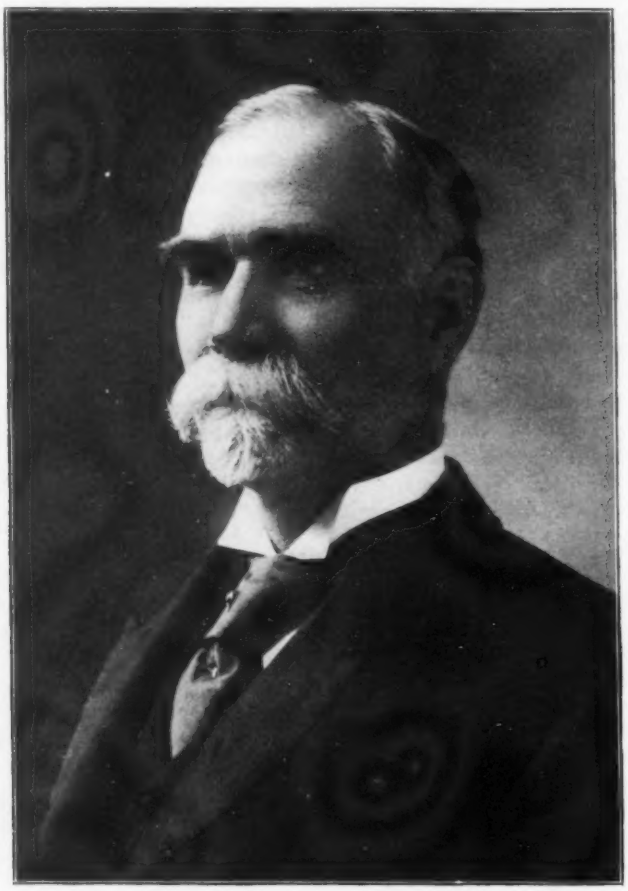
The depression of 1903 and 1904 illustrates the weak point of the Japanese cotton industry. It is dependent on America for the raw material, the short and inferior Chinese and Indian cotton being a very poor substitute.

The British Colonies have increased their exports of raw cotton from 38,453 cwt. in 1904, to 67,019 cwt. in 1906.

Meeting of the American Cotton Manufacturers' Association at Asheville, N. C., May 16, 17.

The tenth annual convention of the American Cotton Manufacturers' Association at Asheville, last month was the most successful in the history of the organization. There was a large attendance, a large number of timely and instructive addresses, and a thoroughly American spirit pervading the meeting. There could be no mistaking the fact that the association was no longer local, and that it had become American in the broadest sense of the term. This received additional emphasis by the selection of Arthur H. Lowe, of Fitchburg, as the new president.

After the convention had been called to order by President R. M. Miller, Jr., addresses of welcome were made by Mayor Barnard, of Asheville, and Governor Glenn. Both speakers made an excellent impression. The reply to their addresses was made by Thomas H. Rennie as follows:



ARTHUR H. LOWE, PRESIDENT, AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

We are here from many states for the purpose of conferring and reasoning together; from the North and the South, from the East and the West

we are come to discuss and advise with each other upon the many problems presented, and to devise the best methods for the solution of each, so that the greatest good may come to all that are engaged in this great industry.

Our program is in your hands and I shall not attempt a resume of its various subjects, all of which, I feel sure, will be of much interest and profit to us; but I do desire to say just a word on a subject that has not been placed in our program, and yet to my mind is of supreme importance. The needs of our industry are many and varied, but none are of more importance than are the markets for the sale of our finished products, one of the greatest of which we are, in my opinion, in great danger of losing, unless we bestir ourselves. I refer to the Chinese market and the conditions at present existing and dominating it.

I doubt if the manufacturers of the United States generally realize the serious effect the Chinese boycott will have upon the cotton industry, and especially on those mills that manufacture coarse cotton cloths, if the boycott is really made effective. There is some doubt in the minds of many intelligent men whether this boycott is anything more than a scare, but the majority of those who know the Chinese people and their character must believe that they intend to see this boycott effective, provided that the Congress of the United States does not enact a law that will place the travelers, bankers, merchants and manufacturers from the Chinese Empire on the same respectable basis that they do other reputable citizens of other foreign countries. It is wonderful to me how the business men in Congress are so over-ruled by labor unions, particularly those of the Pacific Coast, that they should be blinded to all interest of the business man and to the real labor in the cotton mills.

At a recent hearing on the Chinese Exclusion Law before the Foreign Affairs' Committee, there were representatives of 500,000 laboring people, and yet as they were not representatives of union labor the impression that they made upon the Committee was very slight, if any at all. It does seem today as if the leaders of labor unions have more influence with Congress than all the business interests in the United States combined, and I do not believe that I am exaggerating the situation when I say that from a nonpartisan standpoint the average Congressman is more anxious about the votes of the organized labor than he is about the vital business interests of his constituents. Why the organized labor is so fiercely opposed to the average decent Chinaman and yet pays little heed to the horde of Europeans that land on Ellis Island every day, is incomprehensible to the average business man.

The manufacturers of cotton goods and supplies for cotton mills, as well as manufacturers of machinery, should make every effort possible to arouse public interest on the matter of this Chinese Exclusion Law, as, to say the least, our business is dangerously threatened at this time, by the absence of Chinese trade. Whether or not the boycott will be effective in the future, it certainly is for the present, the average Southern mill having sold comparatively little or nothing in the Chinese market within the last six months. It has affected not only cotton goods, but flour and oil, and other lines of business, all of which will feel the boycott if the Chinese make a determined stand about the matter. Ten years ago the cotton mills of the South sold very largely to jobbers all over the United States, and at present the jobbing trade has practically dried up. The mills in the South do not sell ten bales of goods now where they sold one hundred ten years ago. Why this condition exists, no one can explain, not even the jobbers themselves, and yet the facts are as I state them. This is all the more reason why we should foster the Chinese trade, as well as other foreign trade, of every character and description.

While I may not voice the sentiments of the American manufacturers, I certainly voice my own sentiments when I say that to my mind the Ship Subsidy Bill should pass. Every country that hopes to do foreign business must subsidize its merchant marine, and in order for the United States to do business with foreign countries it must place its merchant marine on a paying basis, or otherwise there will be no incentive to capitalists to engage in this enterprise. Markets we must have for our products and I hope that each member of this Association is fully alive to the conditions at present confronting us, and is using all his influence to assist in removing the causes that are keeping trade from coming to us. I consider the subject on which I have touched of such importance to the members of this Association that I feel sure you will pardon the digression from my theme.

We appreciate the warm welcome you have tendered us. We accept the freedom of your city and thank you for your kindly consideration, and we hope that we may receive a part of the uplift that comes to all who cast their lot within your gates; that every act of this convention will be a help to our common interests; that the freedom of the city will be guardedly used, and that the Asheville meeting will be by far the most successful yet held by the Association.

Following Mr. Rennie came the annual address by President Miller:

PRESIDENT'S ADDRESS.

I deem it my duty to submit to you, briefly, a summary of the work of the past year and also to give expression of opinion on current topics of interest to us as cotton manufacturers.

During the year your officers and committees attended a number of important meetings and conferences, all looking to the promotion of your interests and to the betterment of the cotton industry in general.

Just here I desire to thank most heartily the members of the various special committees and our very loyal and competent secretary, for their aid and co-operation, leaving their homes, possibly sacrificing their business, giving their time and money without compensation, for the beneficial results that might accrue to this Association; such loyalty is indeed an omen for good.

Your Association was fittingly represented in the city of Washington on May 1st and 2d at the first

conference ever held between the spinner and producer of cotton.

This conference assumed an international scope inasmuch as among the representatives present was a delegation from the Federation of Master Spinners of Europe, and who, I am glad to say, were warmly and cordially received.

The subjects discussed and the interests involved at this conference are, in my judgment, the paramount issues to be solved and settled by the cotton trade, adverse criticism to the contrary notwithstanding.

These questions have to do with the planting, cultivating and gathering of cotton; the world's consumption and requirements; better methods of ginning, baling and warehousing; more uniform or stable prices, and finally the relation between the spinner and producer.

Upon all of these matters a very free and candid expression of opinion was announced by both planter and manufacturer, and for the present, possibly the most direct benefits to accrue are of an educational character and which will broaden and result, I feel, in much good to all interested.

It is remarkable and worthy of note, however, that two interests so closely identified should have remained strangers for so long a time.

The history of the past, however, is that the planter has ever looked upon the spinner with suspicion and distrust. Prejudice has been engendered and nurtured; low priced cotton has been charged to the manipulation and machination of the manufacturer; buy low and sell high, the planter says, has always been the shibboleth of the spinner—to the contrary, the spinner is not without his troubles and grievances; he has been oppressed at times by excessively high priced cotton; by the utter disregard of the planter, as to the working of the universal laws of supply and demand, by an edict to advance the price to a prohibitory figure, thereby unsettling normal trade conditions and transforming the legitimate margin of profit of the manufacturer into an actual loss.

This long pent-up feeling of antagonism is not real, but entirely imaginary, as undoubtedly the interest of the planter and spinner is mutual and dependent. Eliminate the one and you certainly eliminate the other—the relationship is reciprocal. Calculate, if you please, gentlemen, the value of your cotton mill securities without the raw material and let the planter at the same time calculate the value of his cotton without the consumptive demand of the cotton factory.

Grant, therefore, to the producer a fair and reasonable price for his product and to the manufacturer a fair and reasonable return on his invested capital, and a union of these common interests will enable the American spinner and the American producer of cotton, to dictate to the world the price of the raw material and also the price of the manufactured product.

Let the producer remember that any policy or theory, having for its aim an artificially high price for cotton, is as disastrous in its consequences as a like policy on the part of the spinner, having for its aim an abnormally low price—one extreme oppresses the manufacturer and the other bankrupts the producer, and both lead to a common and inevitable financial ruin.

Differences in the way are no doubt numerous, but surely not insurmountable; it is not the God-given nature of the American to stand still or go backward, but to press onward. Once show him his duty and he will never falter in its discharge.

Again, much is being said and written of late as to the cost of growing cotton, and this phase of the question was very interesting to our English friends during their recent journey through the cotton belt.

I believe that the day of five cent and six cent cotton is gone—gone, because these figures are now below the cost to produce it; gone, because the Southern cotton planter, holding the key to the situation, will demand a greater price; gone, because the old theory that 10 cent and 12 cent cotton would curtail consumption, has been exploded. Except for a short time during the season of 1903-04, the past few years have seen reasonably high prices, and the large increase of spindles and consumption during this period is not therefore inconsistent with high-priced cotton.

Within the past twenty years our consumptive demand has increased very nearly 100 per cent., and this increase has not been checked, but, to the contrary, seems to have been quickened of late by the high-priced raw material.

New mills continue to multiply and especially is this true during the past year in Old England and the South. It is estimated that over six million spindles have been installed in Old England, and, possibly, an equal number in America, during the year; all of these, too, in the face of 10 cent. to 12 cent cotton.

It is a truth universally conceded, that the higher the price of a given commodity, the greater is the purchasing power of the country. High priced raw materials usually bring high wages, and high wages means prosperity.

Another matter of interest and to which a special committee gave attention during the year, is that of crop reporting and estimates. My time will not permit of my going into the various phases of this subject.

We are unable, however, to report much progress to you along this line, our opinion being that the Secretary of Agriculture must call for some resignations in his department before any very efficient service can be rendered the country. We need cotton experts to handle cotton statistics and cotton conditions in the Department of Agriculture.

Upon the subject there is a wide divergence of opinion, and only by concert of action and harmony of all interests combined can we hope to accomplish any improvement in cotton estimates and crop conditions.

Suffice it to say, however, I do not feel that these reports should be abolished and leave us to the mercy of a few so-called statisticians whose sole purpose is to gather such information in order to manipulate the future contract market.

Another subject of great importance, more especially to our Southern members, is the pending bill now before Congress contemplating the preservation of our forests in the White and Appalachian range of mountains.

The effect of the denudation of the forests has been, thus far, to decrease the water power of our

country, from 10 per cent. in some sections to 50 per cent. in others, within the past few decades. All of you, gentlemen, who use water as a motive power in operating your mills, will, I believe, bear me out in this statement. Let us urge upon our members of Congress the enactment of this bill. It is far less expensive now to protect and preserve these forests in their virgin growth than in after years to reforest them in order to prevent floods, overflows, disasters, loss of life and property and final destruction of the great water-ways and water powers which are now the pride of our country.

The scientific cutting of timber creates wealth and at the same time protects the forests for future generations, while reckless destruction means loss to a vast number of our people and ruin to millions of invested capital.

The report of the secretary, C. B. Bryant, read at the business meeting, was in part as follows:

SECRETARY'S REPORT.

Your president and secretary have during the past year selected a permanent button for the association, which has so far met with general favor. It is hoped the members will preserve this button and wear it throughout the year as an insignia of membership, and use it toward furthering the interests and increasing the membership of the society. Those members who have not received one of these buttons should apply to the secretary, who will be pleased to furnish it.

Pursuant to the resolution adopted at our eighth convention, held in Washington, D. C., May 12, 1904, favoring the passage of such laws by Congress as would preserve certain forest sections of this country, the association joined in a forestry meeting in Charlotte, N. C., some months ago, the results of which are believed will be especially gratifying in the preservation of the American forests, particularly in the Appalachian and White Mountains.

At the Knoxville meeting resolutions were adopted memorializing Congress to establish a College of Commerce, in which our consuls and plenipotentiaries and other representatives to foreign countries might receive commercial and diplomatic education, which will be invaluable, and at this time necessary for properly equipping our foreign representatives to meet the exigencies of the time.

It is hoped that in the not far distant future some steps will be taken by our national government looking to the establishment of such institutions.

The board of governors have held five meetings during the year and have in every way kept in close touch with the efforts of the association. Pursuant to a resolution adopted at the Atlantic City convention of the New England Cotton Manufacturers' Association, the presidents, secretaries and committeemen from the American Cotton Manufacturers' Association, the New England Cotton Manufacturers' Association, Southern Cotton Association, and National Ginners' Association held a primary conference in New York, January 24, at which time it was agreed to call a general cotton conference at Washington, D. C., May 1 and 2, to which special invitations were extended to the Federation of Master Cotton Spinners and Manufacturers' Associations to send representation. At this conference in Washington the foreign organization was well represented by a delegation of six gentlemen from England and one from France. Seven associations of cotton growers and manufacturers were represented at this conference, the results of which were principally a better general mutual understanding and closer feeling of mutual interest between these two branches of the cotton industry.

The growth of the association during the last year has been gratifying to officers and members. Our membership roll has been increased by the election of 178 new members, while we have lost by resignation 9 members, and by death, 5, leaving a net gain of 164 members.

Probably the most important action at the Asheville meeting was the passage of the following resolutions, authorizing the appointment of delegates to the International Cotton Congress at Bremen next June:

Whereas: It is generally admitted that much good will accrue to the world's cotton trade by the establishment of closer relation between producers, users and distributers of the fibre, and

Whereas: The recent conference at Washington, D. C., between cotton growers, American, British and European spinners inaugurated an era of closer International intercourse between the managers of every branch of the dominant industry of the world in which the United States takes an important part, and

Whereas: The President of the International Federation of Master Cotton Spinners' and Manufacturers' associations has extended to this association an invitation to send representation to its Conference in Bremen, Germany, June 25, 26 and 27:—

Therefore, Be It Resolved: That the American Cotton Manufacturers' Association assembled in its Tenth Annual Convention hereby accepts the invitation of the International Federation and that the President is hereby authorized to appoint delegates to attend the Conference of the International Federation of Master Cotton Spinners and Manufacturers' Association which convenes at Bremen, Germany, next month. And that the Secretary of the American Cotton Manufacturers' Association be requested to notify the proper officer of the International Federation of this action, and also to inform the gentlemen of their selection for this mission.

Thus the policy inaugurated last year of cultivating closer relations with the cotton spinners and manufacturers of Europe is to be continued. In accordance with this resolution President Lowe has appointed D. A. Tompkins, of Charlotte, N. C., and Charles H. Fish, of Dover, N. H., as delegates to the Bremen Congress. These gentlemen need

no introduction to our readers. No better selection could have been made.

Following is a list of the officers elected: A. H. Lowe of Fitchburg, Mass., president; S. B. Tanner of Caroleen, N. C., vice-president; C. B. Bryant of Charlotte, N. C., secretary-treasurer, and T. H. Rennie of Graniteville, S. C., chairman; W. T. Lang, Knoxville, Tenn.; J. J. White, McComb City, Miss.; T. A. Blythe, Philadelphia; C. H. Fish, Dover, N. H.; C. H. Gordon, Columbia, S. C., board of governors.

There was an unusually large number of papers read at the Asheville meeting. They were devoted to timely topics and the interest they excited was indicated by the discussions that followed many of them:

IMMIGRATION AND ITS RELATION TO LABOR IN TEXTILE MILLS.

BY M. V. RICHARDS, Land and Industrial Agent, Southern Railway, Washington, D. C.

In the matter of immigration, as in the matter of industries for the South, I have little or nothing to offer that is striking or original. On occasions similar to this I may have impressed my listeners—as I may in this instance—with the poverty of new material, in the way of suggestion, that I have to offer.

My concern always has been, and is now, to see the right kind of start made—the rest is easy. When things begin to come your way the tension is relaxed and presently things move along through sheer weight of their own momentum. If a factory is started at some point where industry had hitherto lagged, and it proves a success, in ninety cases out of a hundred it will find imitators, and thus the procession is started. If a rural community receives an accession of foreign immigrants who prove to be successful, I cease to worry about that place, knowing there is a soliciting force at work with friends and relations back where they came from who may confidently be relied upon to come along, as they are able, and swell the number of agricultural workers so sorely needed. I believe I am sometimes charged with being an exponent of the gospel of small things; and those of our friends who associate the idea of immigration with long trains of cars loaded with immigrants eager for the promised land, are disposed to be impatient of the slower, or apparently slower, process of placing two or three families here, and two or three in another place, and so on throughout a vast territory of three or four hundred thousand square miles. Somebody has said that this is immigration in homeopathic doses, and that a larger movement is required to meet the South's needs in the matter of labor, both for farm and factory. However, it is the only rational way that I know anything about. It is the process that was employed with success in the West, for, while we are in the habit of speaking of the railroads' work in populating that great section theirs was the initial work while the later and larger results came from the cumulative work of the settlers themselves—settlers who were satisfied and who sent for their relations and friends to join them. Now it is working in the same way in the South and it is working on a larger scale than is apparent to the superficial or casual observer; while it may be read in the aggregated industrial statistics of the South—we are all more or less familiar with the gratifying statistics being published from time to time touching our wonderful growth in wealth and population, it is not so easy to take cognizance of it through the eye in a section so large. In other words, tremendous changes can take place in a section so large without being obvious to the onlooker. That is our situation in the South today; we are growing faster than we imagine.

I believe it was the Atlanta Constitution which, a short time ago, quoted a man of large affairs as saying: "Although it may seem to you a small thing, yet what first directed my attention most sanguinely to the South was not the report of the cotton and iron values, but the sight of the fences being repaired, roofs patched, windows replaced and gates rehinged." This response strikes a responsive chord. It is the home making in the South, now becoming apparent to the eye, visible along the country highways and from the car windows of passing trains, that is exerting the strongest influence in settling the South, and in the settlement of the rural districts lies, to my mind, the solution of the labor problem for our textile mills. Now this is simply a reiteration of an old position in which I am by no means alone. Settle up your farms, cut your farms into smaller areas and your labor problem in the mills will be quickly adjusted. Your mills will continue then as formerly to draw their chief labor support from the farming districts. In every city and town in the South there are plenty of men who could promote immigration just as effectively and in substantially the same way that they have promoted industrial development. Every family from outside, satisfactorily and contentedly placed, is so much capital invested in your section—more valuable and potent than capital in the form of money invested in factories, which of course I do not mean to depreciate.

Apparently, many cities and towns capable of raising large sums of money for local industries fail to realize the interdependence of town and country; they fail to realize that to insure prosperity for their towns their tributary country shall be promoted with equal energy and skill. The capital required for country districts is men—working people. Some of the overcrowded countries of Europe are filled with the right kind of people, anxious for an opportunity to start life anew in this country, while all over the South, adjacent to busy cities and towns, are thousands of acres of idle lands or, at best, lands only partially used which would fit out enough people with homes to revolutionize conditions as much, or more, in the country as we have witnessed in the cities and towns since the inauguration of the new industrial era. Half a dozen farmers of the right sort are of as much value to a town as a small factory; they are of more ultimate value if they are selected with reference to the influence they will have in bringing others in their wake. I know of an instance of three Bohemian families drifting into an isolated

community; just how it happened nobody seemed to know—they just happened to drop down. In four years the three families had grown into a community of 600 families, or about 3,000 people; and while the native element regarded them with some disfavor at first they are quick to resent any disparaging allusion to them now, for they have been the salvation of that section and the name of a Bohemian farmer is a synonym for thrift, energy and uprightness of character. There is not a man living who can give any plausible reason why there should have been a successful colony of Bohemians there any more than in any one of ten thousand other places in the South, save the sole, solitary one that a little seed happened to drop into that little out-of-the-way place, blossomed and brought forth fruit. There isn't a community in the South that, with a little address and a little expenditure of some money, couldn't import a little seed of that sort and sow it in the right place. They do it to some extent where live stock is concerned or where they want to improve in the yield of the cereals and vegetables; and there is no reason why it should not be done with the people when thousands in the older countries would be glad of the opportunity. When I think of that "volunteer crop" of Bohemians I can't avoid speculating upon what the South would be today, if, instead of leaving this matter of immigration to chance, every community had taken the matter up seriously and methodically; not in a large way, but in an exceedingly small way, each place surrounding itself with a selection of desirable immigrants. In this way small things would have been quickly aggregated into large things; now we are talking, in some quarters, about engineering a large movement before we have fully prepared for it. Large immigration movements come by graduations and through cumulative efforts, each successful immigrant being so much leverage on another. The exception to this rule, with which we are all more or less familiar, and which has been practically brought to a final termination through the exhaustion of the supply of public lands available for entry—the rushing of masses into sections of the far west for homesteading has generally brought more disappointment than success to the earlier participants. Such methods are of course not practicable in the South, even if they were desirable. To my mind the feasible, rational plan for the South to pursue is to simply stimulate the present practice of locating small nuclei of settlers at as many points as possible, and let the leaven do its work.

We hear a great deal about the desirability of this race and the undesirability of some other race in this discussion of immigration, and the apprehension is frequently expressed that the South is in danger of becoming the victim of invasion by menacing hordes of foreigners. My own opinion is that no race of people has a monopoly of all the virtues. There are good and bad among all peoples, and it is at least singular that the race from what the most is feared—the Italian—appears, as far as his performance can be measured by the criminal records of our large cities, to have been the least dangerous and harmful element of our population, while elements of foreign population which we could greet with question have contributed in much larger proportion to the crime and disorder of the country. However, I am not here to advocate the merits and virtues of any particular race of people; I simply want to point out how easy, where communities differ on the question of race desirability, it is to put in practice a form of "local option" applied to immigration. In parts of this State and in South Carolina the foundation stock is Scotch and the opinion is strongly held that this original element ought to be reinforced from Scotland. Nobody can quarrel with that idea. I know a man who conceived the idea that a certain spot in Virginia could be transformed into a garden if he could get a class of farmers from the Western Reserve Section of Ohio, so he managed to begin with one family and today there are twenty-one families there all from one country in the Western Reserve, and the country there is beginning to actually look like the Western Reserve. So I might continue to multiply instances to illustrate the potency of this method of handling immigration in a small way—the small rivulets that swell into the mighty stream.

In selecting my own subject for discussion, "Immigration and its Relation to Labor in Textile Mills," not unmindful of your Committee's admirable repertoire of pertinent and practical subjects for discussion before such a representative audience, I am even now, with your Committee's permission, somewhat in the position of Oliver Wendell Holmes, who on one occasion before an audience of his countrymen said: "Gentlemen, I'll just paraphrase my subject for the milk in the cocoanut," and treat my discussion under the more prolific and pertinent head of "The Textile Mills of the South and their Relation to the Promotion and Furtherance of the Supporting and Uplifting of the Country by and through the Channels of Immigration."

It is not only the want of labor that confronts the textile mill—labor in the factory—but a rejuvenation, and reinforcement of the neighboring rural population. I would change the "want ad" for labor to one for home-seekers. Fill your country with home-seekers on small farms and you have not only assured your labor supply, but vastly increased the tributary supply of material for your factories. When considering the matter of another factory or mill for your town, frankly look over the situation and see if it does not occur to you that more might be done for the town indirectly by doing something directly for the surrounding country, on which the prosperity of your town is primarily based. Is it not apparent to us all, when we stop to think about it, that we are in position to correct this one-sided development so apparent in many sections of the South, and that the textile mill men, as business men of approved judgment, should take the initiative in the movement for relief? Of course the exigencies of the moment have to be considered by the man or corporation whose spindles or looms are idle for want of labor; the pressing need of the moment cannot be ignored, and the employer cannot be blamed for looking for mill labor rather than purchasers for farms, but while doing this he can also employ his means and his influence to advantage in helping to build up the permanent source of his labor and his supplies—the contiguous country.

THE IMPORTANCE OF PROPER ACCOUNTING METHODS.

BY F. W. LAFRENTZ.

Let us now for a moment consider Cotton Mill Accounting and Cost Systems for Cotton Mills.

Since cotton cloth was first manufactured in this country, but little consideration has been given to this subject, because until very recent years, the cheapness of raw material and the relatively large price of the finished product enabled the mills to make a good showing and to pay large dividends without the accurate accounting and record of cost made necessary at such a period as the present—a period in which the cost of raw material, supplies and labor is far higher than in former years. The value of the finished product has failed to increase in anything like the same ratio. To overcome these changed conditions and turn a probable loss into a profit, the exact system of costs and correct accounting methods are necessary, which by reasons of their affording the management a close and comprehensive view of every detail of the business, enable it to stop the various leakages which would otherwise pass unnoticed.

Many mills have been found by us to run some sort of a cost system, but the great majority of them based all items entering into the cost of production—with the possible exception of wages—upon estimated, and not upon exact figures; nor were these estimated figures based upon accounts which were directly connected with the manufacture of goods. And again, a method very frequently found to be in vogue was to estimate the cost per yard by dividing into the average estimated cost per pound of the finished product, the number of yards per pound in each class of goods. For mills manufacturing both fine and coarse products, the estimate obtained in such a manner is manifestly incorrect; although where it is employed in a small mill where great care is exercised in the distribution of expenses, and only two kinds of goods manufactured, both of about the same fibre, the incorrectness of this method is not so apparent. Many a mill which based its cost upon estimated figures and computed the value of each class of goods on the average of the whole per pound, was making and selling its goods without realizing any profit whatever, and the management was necessarily in the dark as to the reason for such an outcome.

Perhaps the greatest obstacles to the employment of more exact systems of recording costs are, first, the lack of an accountant connected with the plant competent to outline a correct system which, while exact in every particular, would be yet simple enough to enable the various department heads to furnish their proportion to the system in a true and comprehensive manner; and, second, the unwillingness of the management to incur the expense of an extra employe to keep up such cost records.

As to the first, the want can be very readily supplied by the employment for the time being of a competent expert accountant to prepare and install a comprehensive system of accounting and costs; and as to the second, it is our experience that the cost of an employe to keep up proper records of cost is insignificant compared with the saving effected by the production of correct figures and the bringing home to the management of the condition of affairs; and it certainly enables the business heads to work to better purpose and more effectively.

The majority of cotton mills keep their books in such a manner that a complete analysis of the accounts spread upon them is necessary before a statement of the actual condition and of the earnings of the plant can be supplied. Frequently, even an analysis will not bring out the facts, so incomplete are the records produced. The statements rendered the management under conditions such as this are not only useless for practical purposes, but positively misleading.

In the cases cited, very few accounts are opened for the purpose of taking up items that have a bearing upon the amount of profit and loss, and they are made the conveyance of anything that the book-keeper may see fit to put through them. For instance, we find a Cotton Account charged with the cost of cotton purchased and credited with sales and claims; and in addition, very often with losses on futures and credited with profits thereon. This, of course, is manifestly incorrect, for the reason that if, for instance, the mill make a profit on futures of a thousand dollars and bought fifty thousand pounds of cotton at ten cents for its own use, mingling the two accounts would leave a balance of four thousand dollars charged against cotton purchased, apparently reducing the price to eight cents a pound, upon which basis the management closes transactions and manufactures goods, when, as a matter of fact, the material could not have been bought for less than ten cents a pound and the calculation should have been based upon that figure.

Of what value would statements of cost be, based upon these facts, with comparison with the future transactions? Suppose, for the sake of argument, that the following month should happen to show a loss on futures of, say, twice the amount of profit of the current month.

Wages Account is commonly charged with all money expended for labor of every description, whether used in operating machines, repairing engines, mill buildings or tenant houses, or digging sewers.

The Supplies Account is frequently found charged with materials necessary for operation, with castings and machine parts, with lumber and glass, with pipe for the village sewer, and other things foreign to the case.

The Manufacturing Account usually shows the inventory of finished product, as well as of cotton in process; and very often the value of supplies on hand.

The Cloth Account shows, in some instances, only the net credit from the agent plus local sales. In other cases it is credited with the gross amount received from the agents, regardless of the fact that a portion of the amount received may at the time be an overdraft granted by the agent.

The Interest Account often shows, indiscriminately, discount on bills payable and bills receivable, interest on funded debt, dividends on preferred stock and cash discounts on materials purchased.

The Rent Account contains merely the credit for rents received, but is not charged with the cost of maintenance and expenses of tenement houses and village; these items are entered against manufacturing cost.

The Expense Account is found to be a general

dumping ground for expenses of every nature. Separate accounts should be opened for the various classes of expenditure, such as manufacturing expenses, repair expenses, selling expenses, general expense and so on.

One item is ignored altogether in the great majority of cases, that of Depreciation, which should enter into the accounts and be considered in connection with the manufacture of goods just as much as cash outlay for running expenses. Unless proper provision is made from time to time to replace machinery or make repairs to buildings, the records produced by the management to the stockholders do not tell the whole story and may lead to a very serious situation of affairs in case it should become necessary to replace any considerable portion of the plant by reason of its worn out condition.

Generally speaking, the mere distribution of disbursements will not be sufficient to bring out the cost of manufacture. Each department should furnish an accurate daily report showing with exactness every detail of the business done or the work performed in that department. Although very many mills have a system of such daily departmental reports, they usually fail to show those minute details so necessary to a complete record, and the information handed up is not brought into the general accounts so that the work done may be taken advantage of; in other words, the cost accounts balance with nothing in the general books, and are, therefore, uncertain, because unless there is someone who knows whether or not these records are right, on their face at least, they become in time absolute estimates and are of very little value.

There is nothing in a system of accounts resting upon proper principles which is complex and that needs to be feared by the management of a concern. Once the details are understood, it is simple and certainly much less worry than the meaningless book-keeping and accounting that is indulged in in so many cases. It seems to me that there is nothing that so eases the mind of the responsible head of a concern as to know that he is always in touch with his business and that nothing can go wrong to any great extent without he receives a speedy warning. Even if business conditions are bad it is a great comfort to know the worst; for to be in the dark as to the outcome of the transactions for a long period is uncomfortable, to say the least. I think the uncertainty is what kills—not the certainty; because one is able to grapple with the known.

Your books of original entry should be analytical in form so as to permit the distribution of transactions under appropriate headings as entries are made, to the end that it may not be difficult to assemble the figures in groups at the end of a period and thus facilitate the work of finding results. It is clear that your transactions in futures have no business to be mixed up with your manufacturing costs accounts; and if you do deal in them, have the books clearly show the result of them by keeping the transactions distinct from those entered into in pursuit of your legitimate business. A professional accountant who thoroughly understands his business and fearlessly pursues his task can be of material aid to you and will see to it, if you appeal to him, that you get a system of accounts that meets your wants—a system at once simple and effective withal. There is no doubt that the use of proper accounting methods enhances the credit of any concern employing them.

THE METRIC SYSTEM IN THE COTTON TRADE.

BY SAMUEL S. DALE, Boston, Mass.

The highest merit of any system of weights and measures is the extent to which it is used. A system of weights and measures superior to either the English or the metric might easily be devised, but it would be worthless as a standard until it had been adopted. While the English system is better adapted to textile work than is the metric, the difference would be entitled to no consideration as compared with the advantage of the more extensive use of one or the other. Thus it is on the extent to which it is employed that any system must rely for its claim to further adoption.

Now, I want you to rid your minds of all the unproven statements you have heard about the wide use of the metric system throughout the world. This will bring us down to what we know or have good reason to believe. How does the English system stand this test? We know what we have in America. We know that the entire cotton industry in America, from the time the fertilizer is scattered over the cotton field until the goods are made up and sold to the consumer, is based on the English yard, inch, pound, ounce, grain and 840-yard skein. This system prevails throughout the British Empire where it is, as with us, a part of the general system of weights and measures. The boundaries of English-speaking countries, however, do not mark the limits of the use of the English weights and measures for cotton. Take, for example, the English system of cotton yarn counts. There is but one country on earth—France—in which it is not supreme, and in France the metric count is not used. This sample card was issued a few years ago in Germany. It shows cotton yarn of various sizes and bears these words: "Die Nummernbezeichnung ist die englische." (The counts are English.) We can form some idea of the value of our English system by considering that the size numbers on this German card are the same as those by which yarn is spun, bought and sold by all the world except France. Evidence of this, such as the following extracts afford, could be extended indefinitely:

Ernst Frank, Mistek, Austria. "Die Kalkulation von Waren aus Baumwollgarn," September, 1904: "I have greatly simplified the calculations of warp and filling yarns by tables of constants, by which width of the cloth is multiplied to give the weight in English pounds or kilogrammes for 100 metres of cloth. These tables are compiled for widths by the Vienna inch, Paris inch, or centimetre. The English system of yarn numbering, which is used in the greater part of Europe, has been adopted for this work, the French and metric systems being given only for the purpose of comparison."

Munchner Allgemeiner Zeitung: "At the hearing of the tariff commission on June 24, 1902, the question of the introduction of the metric system for cotton yarn was discussed. Abgeordnete Munch-Ferber, who is proprietor of woolen and

cotton mills, declared that the introduction of the metric system for cotton yarn would throw the German weaving industry into 'heillose Verwirrung' (hopeless disorder), because the machinery is now based on the English system of numbering."

Here is the latest textile handbook published in Germany, "Taschenbuch fur den praktischen Baumwollspinner und Zwirner" (Pocketbook for Practical Cotton Spinners and Twisters), by Joh. Laetsch, superintendent of spinning, Scharfenstein, 1905. The entire work is based on the English yarn count, while the English weights and measures are the principal standards used. The production table shown at Fig. 1, taken from page 133, illustrates the ascendency of the English standards in this German book. The yarn number is English, based on 840 yards per pound. The twist is given in turns per English inch. The front roller of the machine is one English inch in diameter. The production is given in English hanks of 840 yards, and in English pounds, the latter being reduced to the equivalents in kilograms.

Produktionstabelle für Ringspinnmaschinen.

Effektive Produktion per Spindel in 11 Std. in Ko., Pfd. engl. und Schnellern. Akt.-Ges. vorm. J. J. Rieter & Co., Winterthur.

Spindel-Revolutionen		6000				7000				8000			
Garn-Nr.	Drehung per 1" engl.	Revolut. d. Vorderzyl. per Min 1" engl. Diam.	Ko	Schneller	Pfd. engl.	Revolut. d. Vorderzyl. per Min. 1" engl. Diam.	Ko	Schneller	Pfd engl	Revolut. d. Vorderzyl. per Min 1" engl Diam.	Ko.	Schneller	Pfd. engl.
8	$3{,}25\sqrt{n} = 9{,}192$	208	0,712	12,54	1,568								
	$4{,}00\sqrt{n} = 11{,}313$	169	0,591	10,40	1,300								
10	$3{,}25\sqrt{n} = 10{,}277$	186	0,509	11,20	1,120	218	0,571	12,80	1,280				
	$4{,}00\sqrt{n} = 12{,}649$	152	0,424	9,32	0,932	176	0,483	10,63	1,063				
12	$3{,}25\sqrt{n} = 11{,}258$	170	0,387	10,22	0,852	198	0,452	11,95	0,996				
	$4{,}00\sqrt{n} = 13{,}856$	138	0,322	8,50	0,708	161	0,376	9,94	0,828				
14	$3{,}25\sqrt{n} = 12{,}160$	154	0,314	9,70	0,692	184	0,360	11,08	0,791	205	0,400	12,35	0,882
	$4{,}00\sqrt{n} = 14{,}966$	128	0,258	7,96	0,568	150	0,298	9,30	0,657	170	0,332	10,28	0,734
16	$3{,}25\sqrt{n} = 13{,}000$	147	0,260	9,16	0,573	172	0,301	10,58	0,662	196	0,336	11,82	0,738
	$4{,}00\sqrt{n} = 16{,}000$	120	0 214	7,52	0,470	139	0,250	8,78	0,549	160	0,279	9,82	0,614
18	$3{,}25\sqrt{n} = 13{,}788$	140	0,218	8,64	0,480	162	0,253	10,00	0,556	185	0,282	11,16	0,620
	$4{,}00\sqrt{n} = 16{,}970$	113	0,179	7,10	0,394	132	0,209	8,29	0,460	150	0,234	9,26	0,514
20	$3{,}25\sqrt{n} = 14{,}534$	132	0,188	8,28	0,414	154	0,217	9,56	0,478	176	0,245	10,80	0,540
	$4{,}00\sqrt{n} = 17{,}888$	107	0,155	6,82	0,341	125	0,179	7,86	0,394	143	0,202	8,90	0,445
24	$3{,}25\sqrt{n} = 15{,}922$					140	0,165	8,74	0,364	160	0,187	9,88	0,412
	$4{,}00\sqrt{n} = 19{,}596$					114	0,136	7,18	0,299	130	0,153	8,12	0,338

FIG. 1.

A German ring frame production table based on English weights and measures, the inch, pound, and the 840-yard system of numbering yarn.

A new tariff recently went into effect in Germany. Years were devoted to its preparation with characteristic German thoroughness, and the cotton yarn schedule was deliberately based on the English system of yarn counts. The same thing has been done in Austria, Russia and Spain, while the following extract shows the confusion caused in Italy by bringing statute law in conflict with the established custom of the cotton trade:

Baron Costanzo Cantoni, Paris Metric Yarn Congress, 1900: "We find ourselves in the strange position that all our commerce is based on the English system, while the Government has adopted the metric system for commercial treaties, statistics and the customs tariff."

In Asia the only cotton standard worth mentioning is the English. The samples of cotton goods on exhibition here today, and which were recently collected in the Chinese market, bear evidence of the supremacy of the English system of textile standards in the Chinese trade. These samples are marked with the length, width, weight and price of the goods, and in every case the standards of weight and measure are English, the same as our own. On one of them, Fig. 2, a gray shirting made in England, I found some Chinese characters scribbled with a pencil, evidently a memorandum made by some Chinese merchant. It is translated by S. Y. Tank & Co., Chinese merchants in Boston, as follows:

"Thirty-eight and one-half to thirty-nine yards in a piece; weight, 10 pounds; 38 inches wide; 50 pieces in a bundle."

This is irrefutable evidence of the way the English system of weights and measures has become established, not only in the foreign cotton trade of China, but in the daily work of the Chinese people. On another of those samples from China, Fig. 3 is a label representing a woman in a palanquin carried by two bearers, and over it all the mark "40 yards," a truthful and striking illustration of the way in which English weights and measures are being carried into every part of China by the law of natural selection. That is the higher law before which statute law must give way.

The metric system created by the arbitrary decree of Robespierre has always depended on force for its extension. How weak that force is in the face of natural law is illustrated by this testimony of a Frenchman:

Baron Esnault-Pelterie, Paris Metric Yarn Congress, 1900: "This difficulty (in foreign trade) has been solved in France, as we export to the Far

East our cloths folded by the yard, although the metric is the legal system in France."

Proof that the English system is the cotton standard of the world could be given indefinitely, but surely we need spend no more time in demonstrating this self-evident fact. Throughout the Continental textile industry the only indication of uniformity is in the general use of the English standard for cotton, and the old denier standard for silk.

In addition to the English and denier counts there are 33 or more systems of numbering spun yarn in use on the Continent at the present time: Ten French, sixteen German, four Austrian, one Belgian, one Spanish, and one Dutch. These have resulted from the natural process of reducing yarn counts to metric equivalents without changing the count itself. For example, before the Revolution the French used a convenient system based on 600 aunes per Paris pound. When the metric system was forced on the trade, the manufacturers left the old count undisturbed; 40s still remained 40s, but the 600 aunes per Paris pound were reduced to 714 metres per demi-kilogramme, the present Roubaix worsted system. In this way practically all the old yarn counts are still in use under metric designations, causing the chaos of Continental yarn numbering. A faint idea of this confusion may possibly be obtained from this book of worsted yarn tables, "Tableaux comparatifs des divers numerotages employes pour le Titrage des fils de Laine peignee," recently published at Roubaix, France. This book furnishes a good illustration of the retention of the old yarn numbers, reducing their basis to metric equivalents. It gives the English worsted number as 512 metres per 453 grammes, instead of 560 yards per pound. The old French system of numbering worsted yarn, based on 600 aunes per Paris pound, appears in this book as the Roubaix-Tourcoing system based on 714 metres per demi-kilogramme, called a pound. Variations of the old French system have arisen in different localities so that Fourmies numbers worsted yarn by a system based on 710 metres per kilogramme, while in Reims the textile manufacturers struggle along with a system based on 700 metres per demi-kilogramme. The use of the systems varying slightly from each other causes a confusion that cannot be exaggerated. In order that the textile manufacturer of Roubaix-Tourcoing may not lose all idea of proportion in yarn sizes it is necessary for him to use one system as a landmark to guide him through the maze of multiple systems. Naturally he uses his own mill system for this purpose and thinks of 30s as measuring 30 by 714 metres per kilogramme. Finding a lot of 60s yarn on the market his first thought is that it is half the size of 30s, but if the 60s is made in Fourmies he finds that it is practically the same size as 30s at Roubaix; if the 60s is made in Germany by the metric

FIG. 2.

A memorandum scribbled on cotton goods in China. Translated as follows: "38¼ to 39 yds. in a piece; weight, 10 lbs.; 38 inches wide; 50 pieces in a case."

system, it is 42s in Roubaix; if that 60s is made in England it is 47.4s in Roubaix. To buy yarn equal to 30s in Roubaix he must order 60.1-3s in Fourmies, 37.95s in England, or 42.84s where the metric system is used.

These examples, which could be given indefinitely, show the chaos of weights and measures in which Continental Europe is now involved. Remember that this evidence is all recent, that this confusion exists one hundred and thirteen years after the decree of Robespierre in 1793, and that during this time drastic compulsory laws have been enforced as far as has been in the power of the rulers of Continental Europe to do. The school of experience is a good one and not necessarily dear unless one insists on having his own. In this case we have the experience of Continental Europe to guide us. There is no escape from the conclusion. The failure of the metric experiment under the European conditions so favorable to success, stamps a change of weights and measures under the vastly more difficult conditions in the United States as everlastingly impossible.

So far our examination of the metric system in the cotton trade has shown its units to be badly suited for textile work; its names impossible; the claim for a saving in calculations by it to be false: and its use as an international standard a myth. On the other hand we find our English system to be well suited for cotton manufacturing; the names of the units short, distinct and business-like; cotton calculations by it simple and direct; and the system established as the single cotton standard of the world. In a word, the English system is better than the metric. Moreover we find a complete change of established weights and measures to be hopelessly impossible, and that a partial change leads to indescribable confusion.

It is to the danger of this partial change that I invite your attention. The metric system can be forced by law into many branches of trade and commerce, destroying our present priceless uniformity and causing the chaos of incommensurable standards that now exist in Continental Europe. The danger of such a calamity arises from the indifference of the people that would suffer the most. They are too busy earning a living by the yard and the pound to consider seriously any proposition to change those standards. This indifference has been the opportunity of the metric agitators. For years they have spread their fallacies abroad, holding up the metric weights and measures as the only perfect and scientific system that ever has been or can be devised, the only system that is certain to become universal. At the same time they have denounced the English system in unmeasured terms, as a system that "is in harmony with that of no other nation of the world;" that it "makes us mere barbarians to the more progressive nations;" and that it is "an ugly excrescence on the world's literature and practical arts." They have worked their way into government bureaus and used the executive power to further their plans. They have clamored for change at the halls of Congress, and succeeded in winning many unthinking legislators to support their fallacies. It is but a few weeks ago that the director of the national Bureau of Standards, the sworn custodian of our fundamental standards of weights and measures, appeared in the rooms of the House Committee on Coinage, Weights and Measures and denounced our English system as "not worth a damn."

FIG. 3.
Trade-mark on cotton cloth sold in China, showing how commerce is extending the use of the English system without compulsory law.

Surely that should mark the utmost limit to the metric agitation in this country. It should awaken the people to the danger that threatens the existing uniformity of weights and measures, a danger that arises wholly from popular indifference. So long as theorists are allowed to curse the English system at Washington without protest from you.

just so long will unthinking legislators be led to support compulsory metric legislation. It needs but a popular order, Hands off! to put an end to the agitation forever. In face of such a command from the men who use weights and measures in doing the work of the world the appeals of theorists with nothing at stake will be of no avail.

Today the attack on our established standards takes the form of a bill to make the use of the metric system compulsory in the departments of the government. All sorts of specious arguments are advanced to conceal the real intent of the measure. That intent, however, cannot be hidden. For forty years the use of the metric system has been permissive by the government and the people and yet its use has not increased proportionally. Any further legislation in its favor should, therefore, meet with uncompromising opposition as being an attempt to force on the people a system of weights and measures that cannot win on its merits. To metric agitators the answer should be: "There is the law of 1866 making the use of the metric system permissive. Now go and use it if you want to, but don't try to make us use it if we don't want to."

There is no more important work before the cotton trade than the defense of established standards. There is probably none that receives less attention. It is not merely a national question; it is international in the broadest sense of the term. Today our cotton standards are the standards of every country on earth except France. The defense of our standards is the defense of the world's standards, and there could be no more fitting place from which to issue the order, no meddling by theorists with the established standards of the cotton trade, than here in the South, where nature has placed the cotton fields for mankind forever.

In the discussion that followed, George O. Draper, Hopedale, Mass., expressed his approval of the general argument of Mr. Dale's paper and added that the introduction of the metric system would not only create confusion in the manufacture of goods, but would cause even greater confusion in machine building. Machines now in use would have to be repaired for many years to come and this would make it necessary for builders of machinery to supply parts made to English standards to fit existing machines even though the metric system was adopted for new work. In this way two standards would be in use at the same time causing great confusion and expense. Mr. Draper stated that while the present system may not be perfect it is far better for manufacturers and machine builders to stick to established standards.

CULTIVATION OF COTTON IN LOWER EGYPT.

BY S. H. CARVER.

The sowing of cotton in Egypt commences in the latter part of February and continues into April, according to the crop upon which it is following.

The early sowings are done more by large land owners who require more time to complete their plantings, and can better afford to prepare land for an early use. Small cultivators require to benefit longer by the Birseem (trefoil) crop, which usually precedes cotton, and therefore delays their sowings to the later period.

In preparing land for cotton a certain quantity of farmyard manure is used, but up to recent years the most common and best manure has been taken from the dust heaps of old habitations. These are now becoming exhausted. Chemical manures have latterly been used to a small extent, and the tendency is to increase the use of these. Some years ago the prudent cultivator considered that it was sufficient to plant cotton on a plot of land every third year only, and this was held to be the "custom" of cultivation. It was perhaps a rather ultra-conservative custom and a relaxation of it was permissibly allowed to creep in. Latterly the high price of land and the high rental prices have driven the cultivator into relaxing the custom to an extreme on the other side—sowing cotton each alternate year is practically the least frequent, while sometimes there is encroachment on the 50 per cent. of the land that should be left without cotton.

There has thus been too much over-cultivation of cotton to the damage of lands, forming, no doubt, one of the causes which have reduced the yielding power of the land.

The planting of cotton is done in rows, and the old custom was to plant with a space of 25 to 30 inches between the lines, and about the same space between the sowings along the lines. Here again the same reasons to force cultivation have had influence, and the space between the plantings has been reduced to about half, in order to get more trees on to the feddan (acre). Such close planting has produced fields of trees so thickly bushed together that sun and air have not had the same chance of playing among the trees, and it is only reasonable to suppose that the hindrance of elements so essential to the strong growth and health of the trees has been detrimental to their productive powers. Thus the aim of increased yield has been foiled, while the thicker plantations must have been a heavier burden upon the soil. Here we have another cause for the reduced yielding power.

Moderate waterings are required after sowing until the roots are well made. When sowing, about thirty seeds are put into a sowing, and when the shoots are 3 or 4 inches up out of the ground, these are thinned to 2 shoots.

During the spring and early summer, before the new flood Nile has come down, the irrigation service establishes what are called "rotations," which means the distribution of water by turns into each section of the country, so that each land receives its supply at certain stated intervals; these intervals are generally of about 12 to 15 days, and are certainly not detrimental to the growth of the plant. They may on occasion extend to 20 days.

In fact, perhaps the chief failing of the Fellah as a cultivator—who in general is an excellent cultivator—is his ignorance in the use or over-use of water. While water is at hand it is his creed that he must seize it and there is no doubt that much damage is done to crops by over-watering.

The cotton plant, when once its root is well made, is a hardy plant and can endure privations from water for longer periods than those mentioned above, but prudence must be used in applying water after a term of drought. Thus it often happens that when the Nile flood has come, after a rather severe time of "rotations" bringing a practically unlimited supply of water throughout the country, the Fellah has swamped his fields to excess, producing a wonderfully fine show of large heavily-leafed trees, but with hardly a single pod of cotton produced on them; all the power of the plant has been rushed into wood and leaf.

The period of climatic risks begins in the latter part of August, when fogs and heavy damp may prevail.

What is the actual power for evil in these themselves is not certain. It is more than likely that the damage resulting from them depends more or less on the condition of the plants when they occur. If the plants are strong and healthy the damage is certainly less than when they are poor in strength, either by reason of impoverished soil, or of unfavorable cultivation, or of both.

If the growth of the plants is well forward and the cotton bolls fully formed, the chances of resistance against the damp are much greater than when the pods are in their quite young development—hence the advantage of early sowing above referred to.

Visitations of worms in the cotton have not been infrequent. The last and most serious of these was in 1904, when large destruction was done in some sections of the country. These worms appear in the early season, attacking the leaves of the young plants and afterwards when in the moth stage they lay their eggs on the back of the leaves. The eggs, if left to hatch, produce in two or three weeks another brood of worms that continue the raid upon the plants, and similar reproduction can continue through the summer.

The large destruction in 1904 was caused by the repeated reproductions of the worms. If the pest can be checked in the early stage, the eating of the leaves of the quite young plants is not of material hurt—thus in 1905 the matter was taken in hand by the Government. A decree was sent round the country to order the gathering of leaves upon which the eggs had been deposited, and a large staff of inspectors was established to see to the carrying out of the order. The result was most effective. The check in the early stage was so complete that the reappearance of the worms was insignificant, and the damage through them of no importance.

The ripening of cotton in the Delta is beginning, in a favorable season, in about the middle of September.

The first pickings are taken from the lower parts of the plants and yield the best quality of the plant. When the growth has been favorable it often happens that a large portion of the bolls ripen almost simultaneously, yielding a large first crop of this best quality.

After the first picking the lands are watered and a second shortly follows. Then there remains the top-crop—this has been the most exposed to climatic risks owing to the tenderness of the top shoots during the period of dampness, and often the yield is quite insignificant.

The whole period of picking lasts until about the end of October, and rather later in the northerly, more backward sections of the country.

The average yield of cotton per feddan in Lower Egypt of the two crops of 1904 and 1905 has been about 395 pounds, English.

It is a regrettable fact, and one that calls for reflection, that this yield compares very unfavorably with former years. The cotton crop of Lower Egypt in the year 1897 was in quantity 15 per cent. more than in 1904 and 1905, while it is but a moderate estimate to put the area under cotton in these last years to be 20 per cent. larger than in 1897. Thus the total comparative deficiency of yield is fully 35 per cent.

The cultivation of cotton in Upper Egypt is of recent development and is left out of account in the above figures.

The ginning of cotton is done at large factories situated in central towns of districts. There is no such thing as the small ginning mills belonging to the cultivators as exist in the United States.

Cultivators sell their cotton "in the seed" to the merchants who carry the cotton to their ginning factories. Some of these factories are large establishments which turn out 1,000 to 2,000 cwts. of cleaned cotton per day. The gins are the Platt's knife gins. The merchant, by having the cotton in his hands from its initial state, is able to obtain a more effective selection of the qualities, and thus make up shipments of throughout equal quality. Three or four of the largest ginning establishments have steam presses attached, and these pack cotton ready for shipment to Europe. But the much larger proportion of cotton arrives from the interior in large, less densely pressed bales, all of which are completely reopened and unpacked in order to be again packed into the steam-pressed bales for shipment. This process permits a second effective section of the cotton. The process may sound costly, but, in fact, it allows a cheaper transport charge to Europe, and it delivers bales in a condition which practically calls for no claims for exterior damage, etc.

Steam presses are not likely to increase much in the interior, as they can only be used by large shipping merchants who know that their cotton will be shipped direct to Europe.

Steam-pressed bales are not easily salable in the Alexandria market for many reasons; local traders cannot afford to bring their cotton to market in such form, and even the large merchants have sometimes to consider whether it is not better to bring it in the less densely packed bales in order to have it in suitable form for the Alexandria market in case of need.

By the system of buying cotton "in the seed" the merchants become possessors of all the seed. It is then in the interest of the merchants themselves to make selection of the best crops that they buy and from these take the seed for sowing purposes.

As merchants are known to be trading more or less freely in high grade crops, so cultivators will address themselves to such merchants to obtain the requisite sowing seed. This system will allow of high grade seed continuing for some years, but as is natural in all growths, mixtures will creep in and multiply in extent by years of replanting.

Unfortunately serious deterioration has crept into the Mit-Afifi seed, and endeavors are now be-

ing made—not too soon—under the auspices of the Khedivial Agricultural Society to reselect some of the pure seed which may be worked up again for the reinvigoration of the crop.

The extension of cotton cultivation in Lower Egypt has gradually increased in late years, as new areas of waste lands have been reclaimed and washed, and there are still lands being reclaimed.

If cultivation is again improved and executed in manner to obtain the best results from the soil, the Delta of Egypt with the extensions should increase its cotton crop from 6,100,000 Cantars produced in 1897 to a figure approaching 9,000,000 Cantars (the Cantar, 99 lbs. English).

In Upper Egypt, owing to a remodeling of the irrigation system there, the increase of cotton cultivation has been large. Formerly, very large tracts of the country were used as basins in which the flood water was stored. Cultivation on these lands could only be between the subsidence of the flood and the coming of the new flood, that is between October and July. To grow cotton on such lands was impossible. Now this basin system is being abolished, and the basin lands have been freed for perennial cultivation.

Since 1898 the production of cotton has increased from Crs. 300,000 to Crs. 1.000,000, and the prospects are for a further increase of 500,000 to 1,000,000 cantars.

It may be interesting to make reference to the mode of ginning cotton in vogue in Egypt. As above mentioned it is the Platt knife gin that is used throughout the country. This machine has one fixed knife and a second knife working up and down against the first. The fibre is caught between the knives and is drawn away from the seed by means of a leather roller. In this way there is no tearing of the fibre. The saw-gin machine, which is so much used in the States, tears the fibre from the seed.

The Platt occupies an area of about one square yard, and is able to yield about 100 pounds of lint per hour. This is perhaps not equal to the yield of an American saw-gin, relative to the size of the machines, but the treatment of the cotton by the latter would effectively ruin its value.

ELECTRICITY: THE POWER BEHIND THE SOUTH.

BY W. S. LEE.

The South's greatest asset and advantage consists in its numerous water powers situated throughout the cotton producing and cotton manufacturing district. The South has something like two million horse power still to be developed in the very heart of the cotton field, and in a climate where ice cannot materially affect this development.

It seems strange that this enormous power should have lain dormant in the midst of our factories while they were producing power by steam at a great cost. It would seem that the energy of these water powers was destined to lie dormant until conditions arose in which all factors would work in unison for maximum advantage and that the South would then proclaim that it had become the manufacturer of cotton goods for the world.

The alternating current generator and transformer has helped in a great measure to advance the manufacturing industries of the South by connecting the water powers with the railroads, and although the special advantages of the electric drive with respect to cotton mills have been thoroughly discussed by E. W. Thomas, Louis I. Guion, Sidney B. Payne, and others; we shall, for the purpose of making this paper more complete, now review these special advantages.

1st. With an electric drive a meter can be placed in the circuit, supplying power to any machine or set of machines and the instantaneous power, or total power for any given time measured.

This may not at first sight seem to be of such great importance, but after due consideration the manufacturer will note that one of the greatest problems before him today is how to obtain exact and definite knowledge of the cost of production. Keen competition requires that each operation in manufacturing be figured to a certainty in order that every means may be taken to reduce the cost of production. To illustrate the importance of this question of measuring the power necessary for driving any machine, we note an instance that came under our observation some time ago. One of our engineers was called upon to explain why a certain 75 h. p. motor was running hotter than when it was installed. Going to the watt-meter he found that his motor, together with two motors of the same size, were taking 260 k. w. Knowing that this was abnormal, he asked the superintendent to have the shafting oiled, which was done that night. Next day this meter read 220 k. w.; i. e., for want of oil on the shafting, these motors had been taking over 18 per cent. more current than was necessary to drive the machinery.

2d. By using curve tracing instruments it can be easily determined whether the separate departments of the mill are started on time or stopped before closing time, and if the full load is kept on the machines during all work hours. This furnishes a check on all the departments, not only as to the running condition of the machinery and the power taken to drive it, but also an amount of work done and the time of starting work in the different departments. Also as to whether all the machinery was kept loaded during the total working time or not, and the total time machinery was running. It is almost impossible for the superintendent to keep an eye on all of his men, but if any of the spindles are not running, the power taken by the motor is less and is recorded upon the watt-meter chart.

3d. One set of machines may be operated when it is not advantageous or convenient to run the whole mill. Often one part of the mill gets behind and has to run part of the night. If the mill is driven by its own steam plant the engine attendant and fireman have to be kept on duty and the whole mill run, to supply power for this one part, but if this mill were buying power from a central station, all that would be necessary would be to throw the switch for the one motor and proceed to work. In this connection we have known cases when it was impossible to operate the machine shop in order to make repairs on parts affecting the main drive, simply from a want of these parts. With the machine shop driven by separate motor, this could rarely happen.

4th. The enlargement of mill is made independent of relative position to the main drive. With a mechanical drive all details relating to the enlarge-

ment must be determined before the plans of the original mill are made. The engine, the boiler room and main shafting must be planned with this in view. This means a large additional cost to the mill until the enlargement is made and if the enlargement is not made, a waste of money. But when the electric drive is used it is only necessary to add another building and buy more motors. In many cases the high pressure engine is installed and room left for the low pressure side with the main pulley placed at one end of the mill. This arrangement works very well when enlargement is made shortly after first installation, but we know cases where mills have been working for years on a very inefficient basis, due to the fact that the enlargement has never been made. Again it often happens that a mlll will have an available site for an additional building or wish to drive a pump that cannot be reached with mechanical drive. Under such conditions electric drive displays its adaptability. Furthermore, a mill can be more readily designed to effect a saving in handling a product from one department to another.

5th. The amount of shafting is materially decreased and a saving in frictional losses is thereby effected. This cutting down of shafting means a saving in first cost of the mill, a saving in labor and oil, and adds much to the appearance of the mill. The saving in frictional losses cannot be too strongly impressed upon a manufacturer. As an illustration: The indicated horse power of a prominent cotton mill in the city of Charlotte, with steam power, was 450 h. p.; since using electric motors the power to drive this mill has been reduced to 345 h. p., clearly demonstrating that the frictional losses of engine belting and shafting in the steam drive exceed those in the electric drive.

6th. By the substitution of lighter belts for large heavy ones, a saving is affected at first cost and in bending frictional losses. Before the introduction of the electric drive, large heavy belts were used, but many mills electrically driven are now running with no belt wider than 6 inches. In the old mill several belts were used between the engine and the machine operated, and every belt meant so much slippage and a consequent loss of speed and power. This is confirmed by the common practice among cotton mill superintendents in figuring speed to allow a large percentage for slippage, and in cases where mills have been changed from mechanical to electric drive, by speed being found too high, due to the fact that there was no slippage allowed for, as in the mechanical drive.

7th. The output is increased and the quality of goods is improved. That system which maintains the speed in the machinery nearest to the maximum limit and at the same time maintains that speed constant will show the largest production. That these conditions are more nearly fulfilled by the electric drive than any other motive power is daily demonstrated in mills using this system. This increase in production is due largely to the fact that the torque is constant at all times in the motor. On the other hand the torque of a reciprocating engine varies from nothing, when a piston is at the end of its stroke, to a maximum at the middle and to nothing again at the other end. The speed, even with a heavy fly wheel, varies materially throughout the stroke and causes pulsation on high speed machinery like spindles or warpers. These pulsations in many cases throughout the mill may be multiplied in intensity and should some weak or defective thread encounter this pulsation at a proper time, will break. The machinery being automatic, the moment one thread breaks the whole machine stops until an operator can repair the thread and start the machine. It is due largely to the above reason that the electric drive in many cases has increased the production from 2 per cent. to 4 per cent.

8th. Lower first cost for small manufactures. If the electric drive is suitable for large manufactures it is doubly so for small manufactures. Many firms which are now rated high, were started with very little capital and the cost of steam plant together with land and the building to install engine and boiler was a serious consideration to such an infant industry. For many reasons a boiler and engine cannot be placed in a third or fourth story, while a motor can be placed almost anywhere, and at a very small outlay as compared to that of a steam plant. The cost of coal combined with rental of property on which to erect a steam plant in a city is often enough in excess of what power could be purchased for, from a central station, as would make a good working profit for a small manufacture. Especially is this true if the manufacturer uses power intermittently for his work, or has a variable load. Power that cost $30 per horse power per year used continuously may cost $60, or even more, if used only a few hours each day, for the fires have to be kept under the boiler, and the rent on property has to be paid, whether the engine is doing its work or running idle; while in the case of electric drive the power could be shut off and expense stopped. The manager of a company in Charlotte, using three small engines before conversion to electric drive, recently told the writer that their power now cost them about $2.00 per month more than they formerly paid their fireman.

We now come to a very marked advantage that is peculiar to the electric drive alone. This is an age of centralization and specialization, and when a combination of both is effected the best results are obtained. If it is a paying investment to mill owners to use the electric drive when they have to build separate power plants for each individual mill, would it not be a much better investment if all the mill owners in one town should combine to build a central power station from which to supply power to the individual mills? This, however, is an almost impossible proposition, due to reasons that we need not treat of here. In the majority of cases moreover the manufacturer is not a steam engineer. He does not want to spend his energy studying power house economics and cannot give this question the same close personal attention as the central station manager who has made it a life study. Neither can he afford to pay the same salaries for skilled mechanics and electricians to operate his individual power plant as can the manager of a central station, inasmuch as the large plant will not require more expert attendance than would the small plant, and thus though the labor item in the operation of say, a 5,000 horse power plant, be greater than that of 1,000 horse power plant, the cost per horse power

output is not proportionately the same, but considerably less.

Cost per kilowatt of generating apparatus in a central station is also much less than if the same power had to be arranged for at several independent points.

The maximum capacity of central station machinery will not need to be as great as the sum of the capacities of the isolated plants for the peak loads of the different factories will come at different times of the day, and furthermore, the load factor will be higher for the larger plant. (By "Peak Load" is meant the great load during the day and by "Load Factor" is meant the ratio of average load to the maximum load.)

The manufacturer also knows that when only a part of his machinery is running, all he is saving is a part of his coal bill, and further that the saving in coal is not proportional to the difference between the production of the running machinery and that lying idle, for under the existing conditions with mechanical drive the shafting for the entire plant is belted together. Again, he must at all times pay interest on the investments, rents, insurance and labor for a plant sufficiently large to actuate at peak load his entire factory; whereas, if he is buying his power from a central station his bills are based upon actual amount delivered. This means that when the production is small the fixed charges are proportionately reduced.

It is very evident from the foregoing that centralization of power is profitable to a producer and necessary if he is going to compete with other states and countries, and it cannot matter to him whether the power is generated in his own plant or purchased from another, as long as it is obtained cheaply. In fact the ideal plan would be to buy the power from an independent concern inasmuch as the factory manager can then devote his entire time to increasing the output of the factory instead of endeavoring to keep down the cost of power in his own plant.

In the foregoing paper we have endeavored to show first the railroad and topographical condition which influenced the power development of the South. We have also considered an agricultural and manufacturing development which demanded electrical development in the South. We have also shown some of the features and advantages of the electrical drive, and before closing this paper, wish to consider the financial effect of developing our water powers by the use of electricity. In order to see just what financial effect this could have on the South, we should look somewhat into the relative cost of power generated by steam and cost of electrical power that is offered for sale by the various water power companies throughout the South.

In discussing the comparative costs. we know of no better method than to submit for your consideration actual cost of electric power now being generated by steam in the sub-station of the Southern Power Company at Charlotte, N. C. The plant in question consists of a 1500 k. w. generator direct connected to a 2000 h. p. compound condensing engine with economizers, superheaters, modern and up-to-date in every respect. The cost of this plant was approximately $150,000 and in figuring cost of horse power, we have estimated interest at 6 per cent. and depreciation at 4 per cent. The other items are exact cost as taken from books of the Company for the various month.

	JANUARY	FEBRUARY	MARCH	APRIL
Total Output in Kw. Hours	143,800	120,400	245.200	275,000
Cost of Coal Consumed	$1430.18	$1142.62	$1727.16	$1868.25
" " " " per Kw.	0.0099	0.0094	0.0070	0.0067
" " Oils and Waste	$ 92.09	$ 85.65	$ 100.14	$ 106.64
" " " " per Kw.	0.0006	0.0007	0.0004	0.0003
" " Repairs	$ 14.88	$ 25.08	$ 50.02	$ 50.38
" " " per Kw.	0.0001	0.0002	0.0003	0.0002
" " Labor	$ 284.93	$ 266.50	$ 291.73	$ 293.44
" " " per Kw.	0.0020	0.0022	0.0011	0.0010
" " Int. and Depreciation	$1250.00	$1250.00	$1250.00	$1250.00
" " " " " per Kw.	0.0087	0.0105	0.0055	0.004_8
Total Cost per Kilowatt	0.0213	0.0230	0.0143	0.013
Cost per H. P. per Annum	$ 53.25	$ 57.50	$ 35.75	$ 32.5[0]
Total Cost per Month	$3072.08	$2769.85	$3419.05	$3568.7[0]

(11 hour service, 6 days in the week—approximately constant load.)

It will be noted that no charge for superintendence or clerical work has been made. Also that this plant did not run at full capacity during the months in question, but was used as an auxiliary plant in connection with the water power development.

It will be seen that the average integrated horse power ranges from approximately 700 to approximately 1,500 horse power monthly and that cost per h. p. per year on these results will amount to from $52 to $82. The lowest rate per k. w. hr. for any month's output, so far has been 1.3c per k. w. hr. The Southern Power Company, as well as many other water power companies in the South, are selling electric energy at the rate of 8c per k. w. hr., or $20 per h. p. per annum.

While the above are results from a large plant, we all know that in many of the smaller plants generating from 250 to 500 h. p., the power is costing from 50 per cent, to 100 per cent. more than the above cost.

We can safely say that the development of this mighty agent, which is such an important factor in developing one of the greatest manufacturing centres of the world, will certainly save each and every consumer at least $5 to $10 per h. p. per annum on each h. p. consumed.

Other papers read were: The Evils of Government Crop Reports, W. J. Neale,

president Southwestern Cotton Buyers Association; The Supply and Baling of Cotton, by J. A. Taylor, president of the National Ginners' Association, Winwood, Ind. Ter.; Relation of the Cotton Industry to Southern Development, by E. D. Smith, Columbia, S. C.; The Credit Problem, by P. S. Trevor, The Credit Office, New York; Co-operation in Fire Prevention, by H. L. Phillips, manager, Factory Insurance Association, Hartford, Conn.; The Ideal Automatic Loom, by Geo. P. Erhard, vice president; The Geo. W. Stafford Co., Readville, Mass.; Developments in Air Conditioning, by S. W. Cramer, Charlotte, N. C.; Electric Drive in Cotton Mills, by Frank B. Perry, Boston, Mass.

Following is a list of those in attendance:

Alabama.

Erister Ashcraft, Florence.
Joseph L. Bradley, Huntsville.
D. G. Finney, Huntsville.
J. H. Hicks, Talladega.
G. W. Pratt, Pell City.
G. R. Spencer, Opelika.
Manuel E. Stevens, Montgomery.
Val Taylor, Uniontown.

Connecticut.

H. L. Phillips, Hartford.

Georgia.

C. B. Bidwell, Atlanta.
John M. Boen, Atlanta.
C. J. Brown, Atlanta.
Byron F. Card, Atlanta.
E. Chappell, Atlanta.
J. D. Cloudman, Atlanta.
J E. Coburn, West Point.
J. S. Cothran, Atlanta.
Chas. Warren Davis, Augusta.
H. E. Fisher, Atlanta.
J. M. Hardison, West Point.
E. Lang, West Point.
J. H. Mayes, Fitzgerald.
Jas. M. McGowan, Augusta.
P. J. McManard, West Point.
H. F. Meikleham, Lindale.
John D. Moss, Athens.
J. A. Nelson, Savannah.
W. R. C. Smith, Atlanta.
M. W. Thomas, Atlanta.
T. P. Vincent, Athens.
Geo. C. Walters, Atlanta.
C. S. Webb, Augusta.

Indiana.

Chas. L. Brown, Evansville.

Louisiana.

Philip St. George Cocke, New Orleans.

Maine.

H. P. Garland, Biddeford.

Maryland.

H. H. Straub, Baltimore.

Massachusetts.

A. C. Butler, Boston.
Frank B. Comins, Boston.
T. E. Connor, Westfield.
Samuel S. Dale, Boston.
Daniel J. Danker, Boston.
Geo. Draper, Hopedale.
C. P. Gaither, Boston.
Joseph C. King, Boston.
J. H. Lamb, Boston.
Arthur H. Lowe, Fitchburg.
J. P. Marston, Boston.
H. Midgeley, Worcester.
Frank L. Nagle, Boston.
Frank B. Perry, Boston.
J. L. Sanford, Boston.
A. E. Sproul, Boston.
James Strang, Indian Orchard.
Arthur Wattles, Canton Junction.
Jas. D. Whitaker, Boston.
Chas. E. Whitworth, Worcester.
H. H. Whitworth, Worcester.
Fred Wild, Readville.

Mississippi.

Frederick A. Abbott, Wesson.
H. A. Forchemer, Stonewall.
John McGinnis, Columbus.
Wm. R. Meadows, Agricultural College.
J. White, McComb City.

New Jersey.

Frank S. Tucker, Newark.

New York.

Howard Bible, New York City.
Wm. H. Bilbrough, Elmira.
A. E. Burr, New York City.
A. O. Buzzell, Utica.
C. H. Clark, New York City.
H. Dickson, New York City.
J. W. Hanna, New York City.
Harold C. Hansen, New York City.
Chas. O. Herx, New York City.
Sam. T. Hubbard, New York City.
M. R. Jacobs, New York City.
A. C. Lordley, New York City.
E. H. Lovelace, New York City.
J. J. Manning, New York City.
Chas. A. Meyer, New York City.
Arthur Parkinson, New York City.
L. Paulson, New York City.
John P. Powers, Sing Sing Prison.
W. K. Quilhot, Amsterdam.
Bruce L. Rice, New York City.
H. F. Sevong, New York City.
S. H. Steele, New York City.

North Carolina.

J. A. Abernethy, Lincolnton.
W. D. Adams, Charlotte.
S. B. Alexander, Jr., Charlotte.
Paul Allen, Charlotte.
A. J. Bagley, Lincoln.
Alfred S. Barnard, Asheville.
E. G. Barnhardt, Concord.
Geo. D. Boyd, Charlotte.
J. D. Brice, Gaffney.
C. B. Bryant, Charlotte.
C. H. Burns, Wadesboro.
G. T. Buxton, Charlotte.

J. F. Cannon, Albemarle.
W. G. Chandler, Asheville.
T. L. Chisholm, Sanford.
D. Clark, Jonesboro.
H. C. Clark, Charlotte.
J. W. Conway, Charlotte.
D. Y. Cooper, Henderson.
Stuart W. Cramer, Charlotte.
A. J. Crampton, Charlotte.
T. W. Crews, Charlotte.
D. G. Devenish, Asheville.
W. C. Dowd, Charlotte.
W. C. Elliott, Edenton.
Geo. W. Fraker, Spray.
R. B. Glenn, Raleigh.
J. Goff, Charlotte.
Claude Gore, Rockingham.
J. C. Gregory, Elizabeth City.
P. H. Hanes, Winston-Salem.
W. C. Heath, Monroe.
W. A. Hewitt, Greensboro.
Geo. B. Hiss, Charlotte.
Edwin Howard, Charlotte.
A. C. Hutchison, Charlotte.
J. Kahn, Wilmington.
R. B. Knox, Newton.
E. C. Laird, Haw River.
W. S. Lee, Jr., Charlotte.
T. J. Lillard, Charlotte.
H. H. Lowe, Charlotte.
G. S. Lozier, Asheville.
J. H. Mayes, Charlotte.
L. L. McNair, Rockingham.
J. P. McRae, Laurinburg.
Lawrence McRay, Spray.
Chas. J. Metz, Asheville.
Albert Mildnow, Charlotte.
R. M. Miller, Charlotte.
Samuel F. Patterson, Roanoke.
E. L. Pegram, Stanley Creek.
Geo. S. Powell, Asheville.
Joseph H. Pratt, Chapel Hill.
W. F. Randolph, Asheville.
John C. Rankin, Lowell.
R. A. Ray, McAdenville.
E. S. Reid, Charlotte.
R. S. Reinhardt, Lincolnton.
A. P. Rhyne, Mt. Holly.
B. J. Robbins, Gastonia.
A. G. Robinson, Asheville.
D. P. Rowe, Newton.
Henry Rowe, Asheville.
James P. Sawyer, Asheville.
J. A. Sharpe, Charlotte.
E. A. Smith, Charlotte.
J. G. Smith, Newton.
T. C. Smith, Asheville.
Frank A. Snyder, Pluen.
F. Stekeleather, Asheville.
A. L. Streeter, Asheville.
S. B. Tanner, Caroleen.
R. D. Thomas, Charlotte.
F. H. Tuttle, Gastonia.
R. J. Walker, Charlotte.
A. H. Washburn, Charlotte.
W. T. Weaver, Asheville.
Wm. Whittam, Charlotte.
John P. Yount, Newton.

Ohio.

G. H. Buchanan, Cincinnati.
W. B. Iler, Cleveland.

Pennsylvania.

T. Ashby Blythe, Philadelphia.
Geo. W. Chapin, Philadelphia.
John J. Corbett, Philadelphia.
H. A. Detwiler, Philadelphia.
Martin P. Glynn, Philadelphia.
M. P. Hoffmann, Philadelphia.
E. W. Jenkins, Philadelphia.
Alexander Mitchell, Philadelphia.
David H. McKinley, Philadelphia.
J. Mullineaux, Philadelphia.
Joseph H. Parvin, Philadelphia.
P. S. Steele, Philadelphia.
J. H. Thomas, Philadelphia.
Thomas P. Walker, Philadelphia.

Rhode Island.

E. W. Campbell, Woonsocket.
Hesse P. Eddy, Providence.
A. C. Freeman, Providence.
A. Curtis Lingley, Providence.
E. L. Merrow, Providence.
L. A. Pearce, Providence.
H. A. W. Rice, Providence.

South Carolina.

J. R. Barron, Rock Hill.
W. B. Bruton, Lando.
Fred L. Bryant, Spartanburg.
Geo. A. Buchanan, Rock Hill.
D. Cardwell, Columbia.
Chas. Cyestman, Spartanburg.
H. L. Clayton, Liberty.
R. T. Ferrell, Rock Hill.
R. T. Gaines, Central.
Louis J. Guion, Columbia.
V. Q. Guion, Greenville.
H. T. Harris, Spartanburg.
J. T. Jennings, Spartanburg.
John J. Knight, Sumter.
J. J. Littlejohn, Jonesville.
Wm. A. Mills, No. Augusta.
W. W. Moore, Rock Hill.
T. M. Norris, Cateechee.
J. C. Plant, Cherokee Falls.
T. H. Rennie, Graniteville.
W. H. Rennie, Warren.
W. M. Sherard, Cateechee.
E. S. Tenant, Spartanburg.
R. A. Thayer, Greenville.
E. A. Thompson, Abbeville.

Tennessee.

J. H. Crinkley, Harriman.
Samuel Westhall, Jonesboro.

Texas.

A. W. Pollard, Houston.
W. J. Neale, Waco.

Virginia.

T. Ashby Blythe, Emporia.
H. S. Bard, Williamsburg.
Samuel B. Cary, Roanoke.
J. Y. Mitchell, Norfolk.

The National Association of Woolen and Worsted Overseers.

The 23d semi-annual meeting of this association was held at Boyden Heights, Providence, R. I., May 19. It was one of the largest meetings they have yet held, about 235 members being present and 87 new members admitted. The Providence entertainment committee had exerted themselves to make the occasion enjoyable. Each member was given a souvenir badge in the form of a silk ribbon with a rubber clam attached, that welcomed him to the "land of clams"

On account of the illness of the president the meeting was called to order by the vice-president, Geo. W. Geary, and the report of the last meeting was read by the secretary, Walter Pickford. A committee was appointed to draft a form for a new membership card and the following names for officers were offered to be voted on at the next meeting in November: President, Geo. W. Geary, Collinsville, Mass.; vice-presidents, James McDowell, Providence, R. I.; James E. Oakell, Pascoag, R. I.; J. H. Pickford, Clinton, Mass.; treasurer, Thomas Buchan, Hyde Park, Mass.; secretary, Geo. W. Burr, Fitchburg, Mass.; trustees, John Thornton, Glendale, R. I.; Eleazer Davis, Plymouth, Mass.; Louis Carmack, Lymansville, R. I. It was also voted to revise the constitution and by-laws and the following amendments were adopted:

1. Add new Art. VII of the Constitution to read as follows:

Article VII. Sec. 1. Elective officers shall be placed in nomination at the semi-annual meeting; the balloting for same to be at the following annual meeting, printed ballots to be furnished for that purpose by the secretary with all nominations on one ballot sheet.

Sec. 2. Printed ballots of an official character, for the election of officers, shall be provided by the secretary at each annual meeting. The expense of printing cards and ballots shall be paid for by the association upon presentation of such certified bills by the secretary.

2. Add new Art. VIII of the Constitution to read as follows:

Art. VIII. None but active overseers are eligible to the office of any elective position, and no president shall hold his office for more than two consecutive terms of one year, and no member can be nominated for more than one office, to be voted for at annual elections.

CHANGES IN BY-LAWS AS PROPOSED.

3. Add to Sec. 1 of Art. 1 of By-Laws the following:

The president shall have power to appoint a messenger at each session of the association; the duties of said messenger being to aid in preserving order and to assist in the transaction of the routine business.

4. Change Sec. 1, Art. III of By-Laws to read as follows:

Active overseers in good moral standing, employed in various departments of woolen and worsted mills in the United States, where the wool is in process of preparation or manufacture into yarn or fabric, shall be eligible to membership in this association.

5. Change Sec. 2 of Art. III of the By-Laws to read as follows:

Art. III. Sec. 2. All applications for membership must be submitted in writing on the application blanks of the association, and must be endorsed by two members personally acquainted with the applicant and accompanied by the usual initiation fee. Each application, upon its receipt, shall be referred to a committee of three for investigation, said committee to be appointed by the president. Upon the receipt of a favorable report from the Investigating Committee, in writing, the name shall be balloted upon at the next regular meeting. The identity of members of these committees is to be known only to the president to insure confidential and accurate reports.

Add the following Section to Art. IV of By-Laws.

Sec. 2. Membership cards shall be provided for each member of the association which shall be used to establish their identity at each meeting, or elsewhere, as required.

CHANGES IN RULES OF ORDER AS PROPOSED.

6. Change Rule 6 to read as follows:

New Rule 6. The nomination of officers shall occur at the semi-annual meeting in May, and the election of these officers shall occur at the following annual meeting in November.

7. Add new Rule No. 12.

Cushing's Manual shall govern all decisions at each meeting of the association.

At one o'clock the meeting adjourned and all sat down to a regular Rhode Island shore dinner. Following is a partial list of those present:

W. A. Ahearn, Worcester, Mass.
Fred Ashton, Central Village, Conn.
Louis M. Allison, Worcester, Mass.
E. H. Ambach, Rockville, Conn.
R. E. Anderson, East Rochester, N. H.
C. H. Ashworth, Uxbridge, Mass.
Chas. H. Attridge, Providence, R. I.
David E. Avison, Harrisville, N. H.
Robert Bothwell, Worcester, Mass.
W. H. Brodhead, Central Village, Conn.
Henry Balcomb, East Douglas, Mass.

(Photo. by Wm. Mills & Son, Providence, R. I.) THE WOOLEN AND WORSTED OVERSEERS AT BOYDEN HEIGHTS.

John S. Boyes, Lowell, Mass.
J. E. Bradley, East Douglas, Mass.
Ulric Burke, Carolina, R. I.
J. J. Burns, Moosup, Conn.
John E. Barber, North Bellingham, Mass.
Thomas Byron, Saxonville, Mass.
H. R. Broughton, Plymouth, Mass.
Geo. W. Burr, Fitchburg, Mass.
Thomas Buchan, Hyde Park, Mass.
J. G. Burns, Worcester, Mass.
John F. Bolger, Boston, Mass.
Geo. Berry, Pascoag, R. I.
D. G. Byars, Dayville, Conn.
J. W. Bullard, Providence, R. I.
Geo. R. Burdick, Kenyon, R. I.
John W. Bond, Harrisville, R. I.
J. F. Broadhead, Cherry Valley, Mass.
J. C. Bothwell, Worcester, Mass.
R. E. Bailey, Centredale, R. I.
James N. Clavin, Webster, Mass.
Fred Carter, Pascoag, R. I.
W. E. Chamberlain, Saxonville, Mass.
James H. Cobb, Caryville, Mass.
Thomas F. Crowell, Ashaway, R. I.
J. H. Creaser, Harrisville, R. I.
Louis Carmark, Providence, R. I.
James Carmark, Providence, R. I.
T. J. Cronan, Cherry Valley, Mass.
Fred T. Clark, Somerville, N. J.
A. B. Crowell, Woonsocket, R. I.
George A. Copeland, Peacedale, R. I.
D. Duff, North Bellingham, Mass.
Joseph T. Dolan, Harrisville, R. I.
C. T. Donlevy, Boston, Mass.
Jos. H. Driscoll, Manton, R. I.
M. J. Dwyer, Nasonville, R. I.
J. F. Drummond, Hope Valley, R. I.
Eleazer Davies, Plymouth, Mass.
Edward Donahue, Harrisville, R. I.
Richard Davis, Blackstone, Mass.
Joseph H. Donahue, Quinabaug, Conn.
Thos. Donahue, Providence, R. I.
E. F. Deverall, Providence, R. I.
C. M. Ellis, Putnam, Conn.
E. S. Eddy, Worcester, Mass.
Arthur Ellis, Passaic, N. J.
Geo. A. Eliott, East Rochester, N. H.
Geo. W. Eadie, Greenville, R. I.
Frank Erler, Lymansville, R. I.
E. B. Flannagan, North Bellingham, Mass.
J. G. Faron, Lymansville, R. I.
Joseph B. Faron, Buckland, Conn.
Francis P. Gallagher, Woonsocket, R. I.
Thomas Gordan, Whipples, R. I.
Fred H. Greene, Worcester, Mass.
Thomas Goddard, Caryville, Mass.
Chas. O. Geer, La Fayette, R. I.
Wm. Gillooly, Elmville, Conn.
Geo. Gerry, Collinsville, Mass.
F. H. Graichen, Martinsburg, W. Va.
Frederick Gunther, Fitchburg, Mass.
Asa Garth, Fitchburg, Mass.
Chas. M. Hurst, Providence, R. I.
Edward Heine, Central Village, Conn.
Jas. H. Hillens, Lawrence, Mass.
R. J. Hill, Blackstone, Mass.
Abraham Hey, Woonsocket, R. I.
John Heaton, Stafford Springs, Conn.
P. F. Hanlin, Madison, Me.
R. E. Horan, Pascoag, R. I.
Chas. F. Hacking, Blackstone, Mass.
Clovis Henault, Woonsocket, R. I.
W. A. Hampshire, Webster, Mass.
Samuel Illman, Philadelphia, Pa.
Albert Ingleson, Pawtucket, R. I.
C. B. Jennings, Webster, Mass.
Chas. I. Keegan, Uxbridge, Mass.
Edgar W. Keough, Middleboro, Mass.
Thomas H. Kenny, Uxbridge, Mass.
James Knox, Glendale, Mass.
Chas. A. Kennedy, Millbury, Mass.
J. M. Le Rose, Cherry Valley, Mass.
D. O. A. Lattimer, Greenville, R. I.
John T. Lyons, Norwich, Conn.
James H. Lawler, Maynard, Mass.
John E. Lancaster, Pawtucket, R. I.
Joseph Locke, Franklin Falls, N. H.
Allen Loft, Plymouth, Mass.
Wm. M. Lacy, Pascoag, R. I.
Jas. T. Lord, Blackstone, Mass.
W. H. Lowd, East Rochester, N. H.
Nelson E. Lambert, East Douglas Mass.
Wm. T. Loomis, Quinebaug, Conn.
Thomas Lyons, Providence, R. I.
Lees Mallinson, Mapleville, R. I.
Herbert Midgeley, Worcester, Mass.
W. F. Mulligan, Harrisville, R. I.
James Minto, Greenville, R. I.
James E. McDowell, Providence, R. I.
Edward McGlone, North Billerica, Mass.
J. C. McNamara, Oxford, Mass.
Thomas Mullin, Franklin Falls, N. H.
J. T. McCormack, Ludlow, Vt.
James Mullen, North Bellingham, Mass.
M. F. McTighe, Pascoag, R. I.
W. F. Myers, La Fayette, R. I.
James Mack, Quinebaug, Conn.
Timothy E. Moore, Webster, Mass.
Patrick J. Malone, Bridgton, R. I.
Wm. J. Murray, Peacedale, R. I.
S. J. Neild, East Glastonbury, Conn.
Robert H. Nichols, Woonsocket, R. I.
Thomas F. Nulty, Uxbridge, Mass.
Walter Nieber, Blackstone, Mass.
W. H. Nettleton, Manton, R. I.
James E. Okell, Pascoag, R. I.
Martin O'Toole, Woonsocket, R. I.
Wm. E. Owens, North Oxford, Mass.
Ben Oldfield, Washington, R. I.
Richard O'Donnell, Oakland, Me.
M. C. O'Brien, Old Town, Me.
M. J. O'Brien, Lawrence, Mass.
Archibald Ormiston, Waterville, Me.
Richard Owens, Providence, R. I.
Thomas Pendergast, Lowell, Mass.
W. J. Pearce, Stafford Springs, Conn.
I. C. Partelo, Rochdale, Mass.
J. H. Parker, La Fayette, R. I.
Orville Pero, Woonsocket, R. I.
T. N. Parent, Franklin Falls, N. H.
Wm. Pashley, Ashaway, R. I.
C. H. Philbrick, Bloomfield, N. J.
W. V. Philbrick, Worcester, Mass.
J. D. Price, Methuen, Mass.
Geo. A. Parent, Central Village, Conn.
W. B. Pine, East Douglas, Mass.
Laurence Pendergast, Woonsocket, R. I.
Patrick Purcell, Manton, R. I.
J. H. Pickford, Leominster, Mass.

Edward J. Powers, Kenyon, R. I.
Walter Pickford, Leominster, Mass.
James F. Quinn, Uxbridge, Mass.
Michael F. Quinn, Pascoag, R. I.
P. E. Reiley, Uxbridge, Mass.
J. J. Rae, Cherry Valley, Mass.
John L. Roach, Raritan, N. J.
Hiram Rathbun, Byfield, Mass.
Peter Rainville, Uxbridge, Mass.
James E. Reynolds, Mechanicsville, Conn.
Turner Rollinson, Franklin, Mass.
Thomas Richmond, Elmville, Conn.
Joseph Ridings, Methuen, Mass.
Nicholas J. Reid, Rockville, Conn.
John T. Rogers, Rockville, Conn.
Joseph Schofield, Uxbridge, Mass.
T. E. Smith, Uxbridge, Mass.
E. B. Smith, Uxbridge, Mass.
Tom Smith, Woonsocket, R. I.
John H. Sedgwick, Woonsocket, R. I.
A. B. Shepard, Stafford Springs, Conn.
Chas. Spurr, West Stoughton, Mass.
Thomas P. Smith, Harrisville, N. H.
Eugene Saxe, Boston, Mass.
John J. Shea, Medway, Mass.
Henry R. Schwartz, Pascoag, R. I.
Gustav Schnellschmidt, East Douglas, Mass.
Daniel T. Shea, North Bellingham, Mass.
T. J. Sexton, Greenville, R. I.
John R. Simpson, Fitchburg, Mass.
Andrew Smith, Kenyon, R. I.
James Southwell, Providence, R. I.
Henry Shaw, Leominster, Mass.
Daniel Sullivan, Oxford, Mass.
F. L. St. George, North Bellingham, Mass.
R. C. Schutman, Providence, R. I.
Wm. Sullivan, Cherry Valley, Mass.
Henry M. Templeton, Broadbrook, Conn.
Joseph Tellier, Woonsocket, R. I.
James Toas, Hope Valley, R. I.
Albert H. Taylor, Lymansville, R. I.
A. L. Tainter, Collinsville, Mass.
Thomas Tunney, Hudson, Mass.
E. G. Talbert, Methuen, Mass.
James A. Toop, Washington, R. I.
R. D. Twohig, Norwich, Conn.
John Thornton, Chepachet, R. I.
Geo. H. Thomas, Peacedale, R. I.
Wm. E. Thorpe, Norwich, Conn.
J. E. Truesdale, Providence, R. I.
Thos. Umpleby, Lymansville, R. I.
E. A. Whitehead, Central Village, Conn.
A. J. Wicks, Nasonville, R. I.
Davis Webster, Harrisville, R. I.
John H. Winslow, Elmville, Conn.
Samuel Walsh, Putnam, Conn.
D. F. Welch, Millbury Mass.
Henry Walton, Plymouth, Mass.
Wm. F. Welch, New Boston, Conn.
Fred R. Williams, Washington, R. I.
John Waugh, Norwich, Conn.
W. H. Wilcox, Watertown, Mass.
James Wilson, Manton, R. I.
Frank L. Whittemore, New Boston, Conn.
S. Walker, Uxbridge, Mass.
Martin Welsh, Central Village, Conn.
P. F. Whalen, Worcester, Mass.
Geo. E. Young, Guild, N. H.
Adolph J. Zeigler, Central Village, Conn.

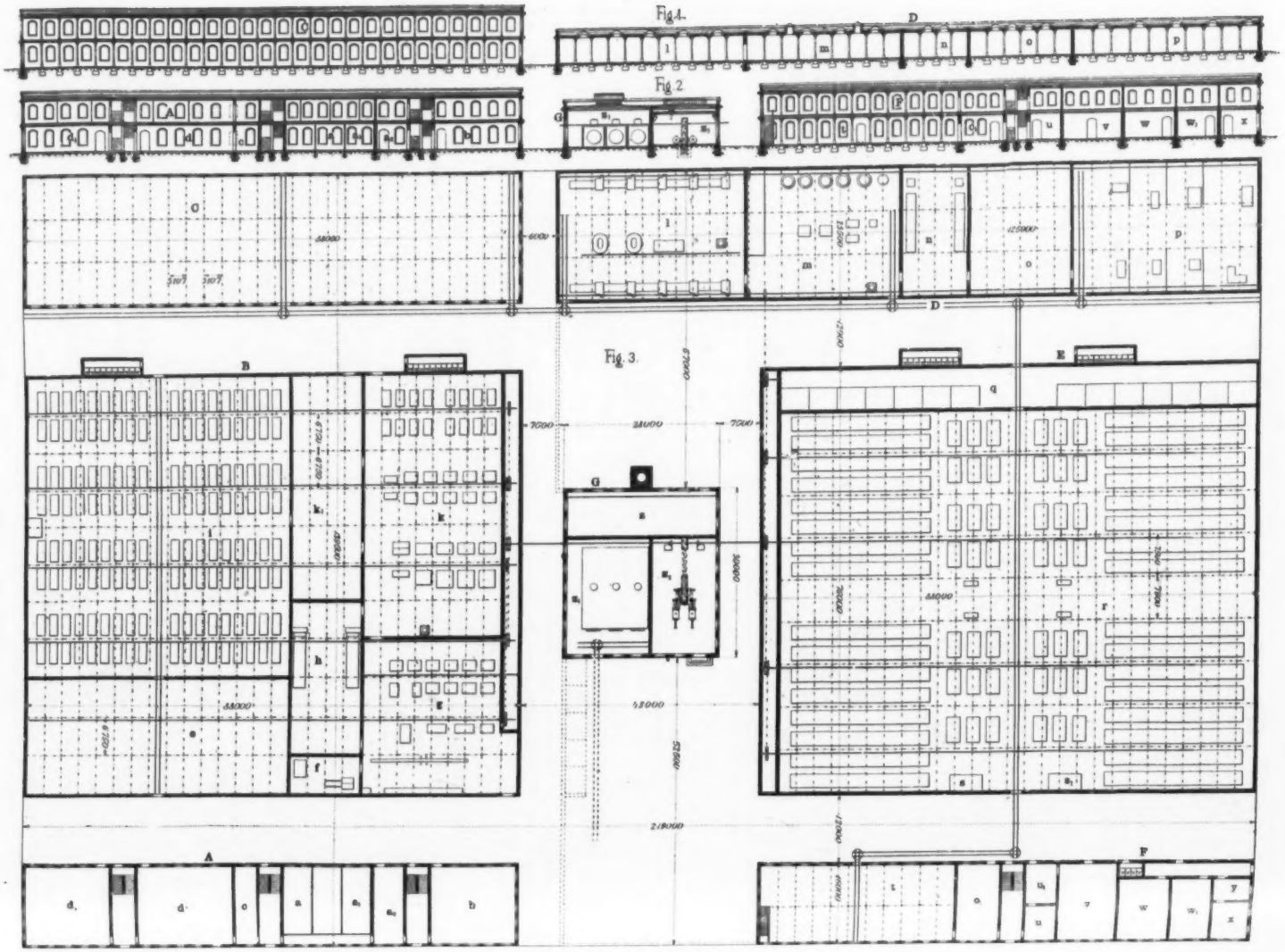
PLAN FOR A WOOLEN MILL.

The plans of a woolen mill recently built in Austria are shown in the accompanying illustration. It is divided into two parts as shown in the ground plan Fig. 3, one part being used for the preparatory and spinning processes, and the other for warping, weaving and finishing. The separate building located a short distance from the front of the mill is used for storage of the yarn and goods and for offices. The boilers, engine and machine shop are located in the building between the mills. The power is delivered to both mills by the main line of shafting driven from the fly wheel of the engine. One disadvantage of locating the boilers in this way is the long distance between the boilers and the dye house and finishing room, l, m, n, o. This could be shortened by setting the power stations in line with the back of the main mill.

The raw wool is stored in the two story building, C, Fig. 3 and the sorting room is in the second story at the right; the other part is used for storage. The first story is divided, one part being used for the storage of the wool, which is carried to the sorting room above by an elevator not shown in the plan. As the wool is sorted it is dropped into bins in the first story at the right. From these bins it is transferred by the railway, D, to the scouring room, e, which contains two wool scouring machines, each with five bowls. There are also in this room two rinsing machines, a soaking tank and an extractor. The dyehouse, m, is next to the wool scouring room. The dyehouse contains five dyetubs and an extractor separated from the rest of the room by a glass partition.

The dyed stock is delivered to the dry room, n, which contains two machine dryers. The material is then sorted in the room, o, from which it is delivered to the picking room, p. The picking room contains the wool and rag pickers and one breaker card. The picked stock is transferred by the railway, D, and the connecting railway to the spinning mill where it is sorted in bins ready for use. There are fourteen of these bins, seven on each side of the railway as shown at q, Fig. 3.

A glance at the plan shows that the spinning mill is divided into three parts. Each



PLAN OF A WOOLEN MILL

end of the mill is used for spinning while the cards are placed in the centre. The small rooms, s s, are separated from the main room by glass partitions and are used for samples. The closets are located at E. Each of the ring frames has 400 spindles, making a total of 12,800 spindles to supply the 144 looms in the other building. The spun yarn is delivered to the storage room, t, by the railway as shown at Fig. 3. Under this room is a cellar used for yarn storage. Next to the room, t, is the shipping room, c, adjoining the hallway and forming the main entrance to the mill. At the right of the hallway are the offices, u u', and the supply rooms, v. Next comes the wardrobes, w w', and the watchman's rooms, x y, adjacent to the hallway.

The spun yarn is carried to the spooling and warping room, e, on trucks. The warping room has four sectional warpers and two sizing and beaming machines. In the adjacent room are the twisters and spoolers. There is plenty of room allowed here for the drawing-in frames. The 144 looms are placed in eight rows in the room, i, as shown at Fig. 3. The looms are of two sizes, 72 and 96-inch reed space, and intended for 6/4 goods. The cloth from the loom is delivered to the burling and sewing room, k', from which it is delivered to the fulling mills and washers in the room k. In this room there are 16 washers and ten fulling mills, the goods being washed both before and after fulling. Next come the ten napping machines. From the nappers the goods go to the dryers in the room, h, whence they are delivered to the dry finishing room, g, which contains ten longitudinal and two cross shears besides the brush, two rotary presses and one plate press. After pressing, the goods are steamed and sponged in the room, f, after which they are pressed for the last time in the plate press and then sponged for the second time. The finished goods are taken to the storage rooms, d d', where they are ready for shipment.

The building, A, in front of the weaving mills, B, is divided by three stairways. The main office, a' a^2, are between two stairways; the room, b, is used for storage. The boiler room contains three boilers, each with 1600 square feet of heating surface. Adjoining the boiler house is the coal bin from which the coal is transferred by a railway. Next to the boilers and engine is the machine shop, z. In the machine shop is placed the dynamo for lighting and power; the wires run from the dynamo to the mill by underground passages. The scouring, dyeing and picking machinery is driven by a motor from this dynamo. The construction is fireproof and the mill is covered with a cement roof.—Uhland's Technische Rundschau.

AMERICAN COTTON IN JAPAN.

Kobe, April 18, 1906.

Editor Textile World Record:

The cotton season during the last year was the worst the importers of this district ever experienced, the losses being enormous. This was due to the lack of landing facilities

FIG. I.

at Kobe, the unprecedentedly bad weather, and the shockingly poor manner in which bales of cotton were marked. It was also difficult for consignees to take delivery of cargo on account of thousands of coolies as well as hundreds of lighters having been commandeered for the war, the shortage of lighters making it impossible to carry cotton from the landing place to the mills. The consignees fought the steamship companies, alleging that they had no right to land cotton in the open, no right to put cotton where

they could not take delivery, and in fact, declared that the companies had no right to import cotton if the consignees could not immediately obtain delivery. The steamship companies, however, were fortunate in paying only for differences in grades and actual shortage of cotton, although they were threatened with claims for hundreds of thousands of dollars.

FIG. 2.

The two photographs herewith were taken at the Minatogawa customs compound. Fig. 1 shows a bale of cotton with mushrooms growing from it, also a considerable number of bales lying in the open in the most deplorable condition. Fig. 2 is another view of cotton lying in the open and exposed to all kinds of weather.

W. W. Campbell, Agent,
Pacific Mail Steamship Co.

Cotton Raising.

The discussion in England over the plan to invest English capital in cotton plantations in the Southern States has brought out an interesting bit of history which, though rather ancient, yet carries a valuable lesson for those who are figuring large profits by subtracting an estimated cost of 5 cents a pound from an estimated selling price of 12 cents a pound. An American visiting Manchester discoursed to a reporter of the Guardian about the wealth that would come to those who put their money into cotton raising. This brought out the following letter from a man who heard and followed similar advice forty years ago:

Sir: In your issue of this day (May 10) is an account of an interview accorded to a member of your staff by Mr. Samuel B. Woods, of Virginia, on cotton growing in the Southern States of America, as it might be accomplished by English mill owners. Mr. Woods is an American agriculturist, and may know exactly what could be done in cotton growing on the 30,000 acres of land to which he referred. It reminded me of something that happened to me and other residents of this city and Liverpool in 1866. An enterprising American came to Manchester when the war of the North and South had only lately ended and cotton was still scarce and very high in price. The late David Chadwick called together some of his numerous friends and introduced the American to them. So grand a story was told to them that a company was formed, with a capital of £70,000, which was largely in sums of £5,000. An American who was one of the partners in an American mercantile house in this city was sent out to look at certain farms, with powers to purchase, and several fully equipped farms were purchased as going concerns at an average cost of £3 per acre —about 12,500 acres in all. We were assured that one bale per acre was by no means an overestimate of the probable average crop. We sent over a superintendent manager from Manchester, and we had great hopes of success. In fact we were so hopeful that on finding that our subscription list was about £3,000 deficient we refused to allow to Mr. Chadwick the privilege of taking up the balance himself.

Our first crop was very much less per acre than we had looked for, but it sold for 8 1/2 d. per pound on arriving in Liverpool. The business was continued for several years, but the average of the produce was less than half a bale, except on one of the farms, which gave two-thirds of a bale. The price of cotton gradually fell, and the final outcome of the venture was a total loss of all our capital in six years. The late John Watts, so well known to some of our older citizens, wound up the concern as liquidator. The name was the Georgia Land & Cotton Company, Limited, and I fancy that I am the only director and shareholder of the company who survives to tell the story. The rock we split on was the yield per acre, and I would point out that even now, with forty years of time to have made improvements in cotton culture, it takes some thirty millions of acres to produce a ten to twelve million bale crop. Yours, etc.,

W. Pickstone.

5, Moor Lane, Kersal, May 10.

It is said that the area devoted to flax culture in France has declined from 200,000 acres in 1870, to 60,000 acres at the present time, and that the government has issued an appeal to the farmers to increase their acreage.

ESTIMATING THE COST OF WOOLEN GOODS.

The merchant who acts only as a distributer of goods has no difficulty in determining the cost of his wares. The invoices tell him in plain figures the cost of his merchandise, ufacturing woolen goods he must invest in raw material in the form of wool as it comes from the sheep's back, in raw cotton, shoddy, waste, fuel, oil, soap, dyestuffs and chemicals, machinery, belting and other supplies. He pays out large sums for labor and in return for this outlay finds in his possession a stock

Monthly Statement of a 12-set Mill on Dress Goods. 36", ends 36 picks

Dept.	Product	Labor	Expense	Average Labor	Average Expense
Sorting	74,765 lbs	299.06		.004	
Scouring	29,906 "	101.68		.0034	
Coloring	29,906 "	221.30	852.32	.0074	.0285
Picking	29,906 "	59.81	86.73	.002	.0029
Carding	148,500 lbs	519.75	133.65	.0035	.0009
Spinning	148,500 "	772.20	29.70	.0052	.0002
Spool & Bunch	6187 lbs	346.50	13.61	.056	.002
Weave. Day.	74,250 yds	534.60	51.98	.0072	.0007
Weave. Piece	74,250 "	1752.30		.0236	
Finishing	74,250 "	816.75	185.62	.011	.0025
Repairs	74,250 "	155.92	51.98	.0021	.0007
Ins & Taxes	74,250		371.25		.005
Fuel	74,250	80.19	348.98	.001	.0047
Freight etc	74,250		133.65		.0018
General	74,250	482.67	155.92	.0065	.0021
		6142.68	2415.39		

Dividing the labor cost ($6142.68) by the yardage for the month (74,250 yds) gives us .08 27/100, the average labor cost per yard. Dividing the expense cost ($2415.39) by the yardage (74,250) gives .03 25/100 as the average expense cost per yard — the total for labor and expense being 11 52/100 cents per yard.

FIG. I.

which, undergoing no change while in his possession, is sold in the same condition as when purchased, with a certainty as to the profit or loss of any transaction.

The manufacturer on the contrary has to face a far different condition. If he is man- of manufactured woolens of various grades and market values. No clue as to their cost per yard can be obtained from the payroll, or invoices of material and supplies. What the goods cost per yard, how much for raw material, for labor, and for all the other expenses

are questions that must be met, and upon the accuracy of the answer depends the success or failure of the business. If the manufacturer relies on guesswork or on inaccurate methods of estimating, he may be selling his goods at a loss or holding them at a figure so high as to prohibit their sale. He will then occupy the position of a merchant who ignores the cost in fixing the selling price of his goods. The ultimate result of a business so conducted cannot be a matter of doubt.

It is of the utmost importance to every manufacturer, not only to estimate closely the cost of his own goods, but that all his competitors should be able to do the same, for the manufacturer who sells goods in ignorance of their cost, not only ruins himself but spreads demoralization in the trade and causes loss to all other manufacturers in the same line. However much manufacturers may try to keep the knowledge of their machinery, processes and fabrics from their competitors, the possession by every mill of the best method to determine the cost of the goods per yard is of benefit to all.

To make this article of use to the greatest number of our readers, it will be necessary to avoid a detailed account of the cost of any one branch of manufacture, and confine it to as clear a statement as possible of the general principles, leaving to each mill owner the work of applying them to his particular requirements.

The cost of the material per yard can be more readily determined than the cost of labor and expense, as only three factors are to be reckoned with in the cost of the stock, viz: cost of raw material per pound, percentage of shrinkage in manufacture, and the value of the waste products. The fluctuations in the amount of the mill's production do not affect the cost of the raw material.

It is necessary to compile statistics of mill work to show the product obtained from material supplied to each department of the mill, such as the various quantities of each sort obtained from the wool purchased, weight of scoured or colored stock from materials supplied to scouring and dyehouse, the yarn obtained from picked stock and the quantity of finished cloth produced from goods as they come from the looms. From such records the cost of the raw material in any one of our fabrics is readily calculated.

Monthly Statement of Fixed Charges of a 12-set woolen mill on Dress Goods 36" wide, 36 picks

74250 yds 36 inch goods, 36 picks = 26730 yds. 4/4, 50 picks

Dept.	Product	Labor	Expense	Average per yd. 50 picks Labor	Expense
Weaving	26730 yds	534.60	51.98	.02	.002
Repairs	"	155.92	51.98	.006	.002
Int. + Taxes	"		371.25		.014
Fuel	"	80.19	348.98	.003	.013
Freight	"		133.65		.005
General	"	482.62	155.92	.018	.006
		1253.33	1113.76	.047	.042

FIG. 2.

In a mill making but one fabric the labor and expense per yard can be found by dividing the total amount of payroll and expense charges for any given period by the number of yards manufactured during that time. Such a calculation, however, in a mill making two or more fabrics would give only the average cost of all the goods, and would aid but little in forming an estimate of the cost of any one fabric. The great variety of goods, varying in quality, weight, size of yarn, number of threads per inch and in finish made in the

same mill complicates the calculation of the cost of labor and the expense of one fabric. A mill may have several classes of goods in process at one time, some requiring careful sorting of the raw material, while others are made from stock as it is received; some stock dyed, others piece dyed. Under such conditions a system must be adopted that will apply to portion to each grade the expense that its manufacture entails.

To do this we must first learn the cost of each process. This can be done only from the records of each department, carefully collected during a period of at least six months, when such department was operated at its full capacity. These statistics are the basis of all our calculations. They not only furnish us with the facts on which we base the cost of each of our various fabrics, but also with a clear statement of the work in different departments of the mill. They should be compiled monthly, and these monthly reports will prove very valuable to the manager of a mill, showing him at a glance whether the department is doing its work at a greater or less cost than in former months, and indicating the effect of any change of machinery, help or methods. A form for such a monthly statement will be found at Fig. 1.

Each department has its own unit of production, such as the pound of stock for the dyehouse, the run of 1,600 yards of yarn for carding and spinning, the yard for weaving, etc. The average cost for each department is found by dividing the total cost by the production.

Cost Estimate of Woolen Cassimere.

15½ oz. per yd. 4/4

2800 ends, 3⅝ runs; 68" wide in loom, 50 pks. 3⅝ runs

Stock shrinks 15% from clean wool to yarn.

15% " yarn to finished goods.

21⅞ oz. stock required for yard, 42¢ lb; .562 cost of stock

	Required per cent	Manufacturing Average Labor	Expense	Cost per cent Labor	Expense
Sorting	156 lbs	.004		.62	
Scouring	63 "	.0034		.21	
Coloring	63 "	.007	.03	.44	1.89
Picking	63 "	.002	.003	.13	.19
Card. & Spin.	221 -	01	.001	2.21	.22
Spool. & Dress	7 sec.	.056		.39	
Weaving Pc.	50 yds	.089		4.45	
Finishing	47 "	.036	.023	1.69	1.08
Fixed	50 "	.049	.042	2.35	2.10
				12.49	5.48

	Cost Stock per yd	.562
12.49 / 477 yds	" Labor "	.266
5.48 / 477	" Expense "	.116
	Mill cost per 4/4 yd	.944

FIG. 3.

The fixed charges, such as fuel, freight, insurance, taxes, etc., must necessarily be averaged on some arbitrary plan. The department of the mill with the lowest capacity of production measures the production of that mill, and the production of that department is used as a basis for calculating the average cost of fixed charges. As yarn can be and generally is, purchased to keep the looms running full, the weaving department in most cases serves well as a basis for calculating fixed charges. As the goods vary widely in the number of picks per inch and consequently in yards produced, this weaving product must be reduced to an equivalent yardage with a constant number of picks per inch. Assume that we have adopted 50 picks as a basis, and the product in a given month is, say, 10,000 yards, averaging 40 picks per inch. The equivalent of this product in 50-pick goods would be 8,000 yards. If in another month the product should be 5,000 yards, averaging 80 picks per inch, the equivalent would again be 8,000 yards of 50-pick work. This reduction of the yardage makes the report much more valuable for comparing the operations of the mill during different periods.

When estimating the cost of any particular grade, we must figure the cost of each process through which the fabric passes, and a method which has been found both simple and efficient consists in calculating the quantity of material which must pass through each of the necessary processes to produce one cut of the goods. For instance, we find that a cut of cloth which measures 45 yards finished, may require 200 pounds of wool to be sorted, 70 pounds of clean wool to be colored, 100 pounds of stock to be picked, 250 runs of yarn to be spun, 55 yards of warp to be dressed, and 50 yards of cloth to be woven and finished. Each of these items is extended at the average cost of the process, fixed charges being calculated per woven yard. The sum total of these items divided by the 45 yards of finished cloth per cut will give the estimated cost per yard of that fabric for labor and expense. If the cloth is made with a greater or less number of picks than 50, the average used for fixed charges is increased or diminished in corresponding proportion.

There is but one proof of the accuracy of any cost estimate. When an inventory is taken and mill accounts closed, the yardage of the various fabrics should be extended at their estimated cost, and the sum total compared with the actual cost as shown by the counts.

Fig. 2 is a statement of the cost for fixed charges as indicated by Fig. 1, but reduced to a basis of 50 picks. The actual monthly production was 74,250 yards, 36 inches wide, 36 picks. As the goods were woven two widths in the loom the yardage was one-half this amount or 37,125 yards, 36 picks per inch. Assuming these looms to have operated with the same efficiency on a cloth having 50 instead of 36 picks per inch, a proportionately less yardage would result. A simple calculation gives 26,730 yards of 50-pick goods as the equivalent. This reduction is made for the purpose of having a standard of production by which to calculate the average cost per yard of the so-called fixed charges, and by which to compare the product of different months. One yard of goods containing 50 picks per inch is taken as the yard stick by which we measure the work of the mill and determine the efficiency of its operation.

Two important items of cost, interest and depreciation, do not appear in our statement, and have been omitted because they vary so widely among different mills. Care should be taken to allow for them in estimating the cost of goods.

Fig. 3 illustrates the method of estimating the cost of a particular fabric. This estimate was based upon the averages obtained from Figs. 1 and 2, The different items of cost are first placed in the left-hand column; in the next column appears opposite each item the material or work required for one cut. In the next two columns are the cost averages for labor and expense. The total cost per cut for each process is then extended and placed in the columns at the right. These items are then added and the totals taken as the estimated cost of labor and expense per cut.

The average cost per yard is found by dividing the total cost of raw stock, labor and expense by the finished yards per cut. These three items are in turn added and the result is the estimated mill cost of the fabric per yard.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE SCHOOL.

Weave Fig. 19 shows us the combination of the 8 harness mock leno weave given in Fig. 4, combined with the plain weave for regular weaving, using 24 warp threads and 24 picks of one weave to alternate with the same number of warp threads and the same number of picks of the other weave, the resultant weave repeating on 48 by 48. The reeding in this instance, as will be readily understood, since 4 threads to the group of

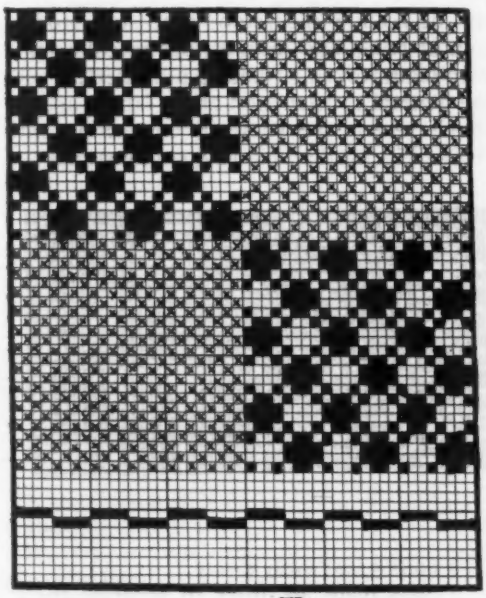


Fig. 19

the mock leno weave will require us to use 4 threads in a dent, leaving between each group one or two dents empty, the reeding as thus explained being shown below the weave.

MOCK LENOS OR OPEN WORK EFFECT.

Weave Fig. 20 shows us the same mock leno weave as in the preceding example, using it again in connection with the plain weave, 16 warp threads and 16 picks of one effect to alternate after the "plain setting" for motive, with 16 warp threads and 16 picks of the other effect. The mock leno weave is shown by means of ■ type, using [.] type for the plain weave.

By means of ▨ type, we have shown introduced a figured effect in the plain weave, a sort of entwining effect, a feature which, however, calls for quite a number of harnesses, 28 harnesses in this instance, and which possibly might not be within a scope of every dobby, although it will make no difficulty in a fancy mill, and where dobbies above that number quoted are extensively met with.

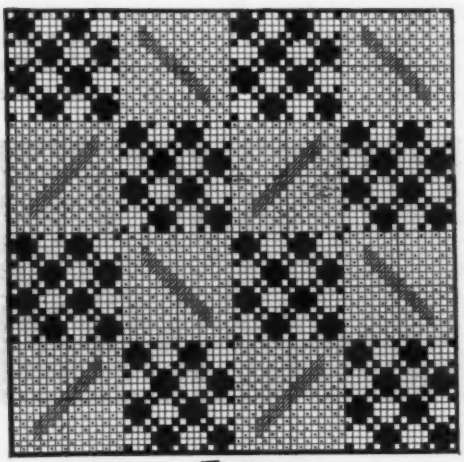


Fig. 20

In connection with diagram Fig. 21, we show up a striped effect of mock leno in connection with plain woven parts of the fabric, a system of designing frequently met with in the manufacture of cheap grades of curtains; using in this instance in connection with our weave

8 ends plain,
6 groups of the 6 harness mock leno, given in connection with weave Fig. 1 of this lesson,
3 groups of the 6 harness mock leno previously referred to,

8 ends plain,

the complete weave given repeating on 43 warp threads × 6 picks.

We have shown in this instance empty squares in the design to represent the one or two dents as must be left empty between each mock leno group, as well as between the joining of the last mock leno group towards the plain woven portion of the fabric. At the same time we must mention that we rather used only small effects for the plain weave as well as for the mock leno weave, in order to bring the weave, i. e., the full design, within scope of the page, either effect as well as the combination of both being generally more elaborately used in the fabric. However, the student cannot help but grasp the principle of designing from weave given, as well as explanation accompanying the same, it certainly being the means to construct an endless variety of similar effects from it.

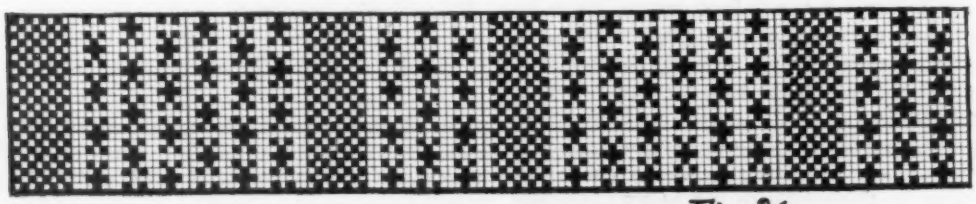


Fig. 21

Mock leno weaves as thus shown in connection with the plain weave are often used as grounds to brocaded goods, being then commonly used in contrast to twills and satins in getting up parts of ornaments applied to these fabrics. Such combinations require a careful study of the cloth structure thus produced, for very readily they will result in a cloth in which the practical utility is nil. Wherever large masses of such weaves are used for grounds, the figure then must be outlined with two or more ends of plain weaving, in order to hold the loosely floating threads of the figure in the proper position. If referring more particular to striped effects, as shown in connection with weave Fig. 21, it will be readily understood that the introduction of twills and satin stripes in connection with plain woven stripes do not interfere with the general construction of the fabric, and for which reason we show in connection with weave Fig. 22 the following combination:

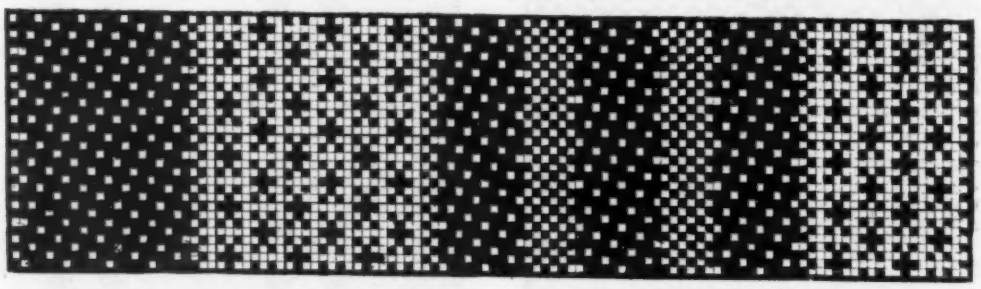


FIG. 22.

20 ends 5 leaf satin weave,
2 ends plain, in order to separate the 5 leaf satin from
6 groups of mock leno.
2 ends of plain, in order to separate again the mock leno from
10 ends of 5 leaf satin. } × 2
6 ends of plain (stripe effect) }
10 ends of 5 leaf satin.
2 ends plain weaving, in order to separate said satin stripe from
4 groups of mock leno weaving,
2 ends plain in order to separate the mock

leno from the satin stripe (see repeat of weave), the complete weave repeating on 98 warp threads and 30 picks. In the same manner as we used the satin in the previous example, as will be readily understood, we can also use any one of our regular twills, granites or in fact any weaves we might desire to

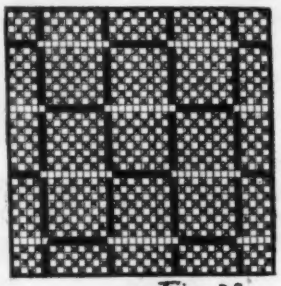


Fig. 23

interlace in connection with said mock leno weaves.

IMITATION GAUZE WEAVES PRODUCED THROUGH INTERLACING HEAVY ENDS, WARP AND FILLING WAYS, WITH A SPECIAL WEAVE.

In order to explain this system of designing, the accompanying illustrations, Figs, 23 and 24 are given, the fabric produced being excellent imitation gauze effects. In constructing these fabrics care must be exercised that the heavy threads in warp and filling receive excessive floats, in order that they can throw themselves readily towards one side or the other.

Examining weave, Fig. 23, repeating on 18 warp threads and 18 picks, ■ type indicates the heavy threads in warp and in filling, the arrangements in both systems of threads being

8 threads fine yarn (see ⊠ type),
1 thread heavy (see ■ type).

Examining the weave will show us that the heavy warp threads float over all the fine picks, and only interlace with the structure in connection with the heavy picks.

This system of interlacing heavy threads can be used also in connection with other weaves than the plain weave, Fig. 24 representing in this instance the $^{2}/_{2}$ 4 harness broken twill used in place of said plain weave in the previously given example, the repeat of the pattern being 36 warp threads and 36 picks.

However, we must remember that in connection with these weaves, the plain weave is the one to be preferred for interlacing the light warp threads and light picks, since this weave produces the smoothest face, at the same time giving the least opposition towards the pushing of the threads out of position as is necessary for the effect.

Turning weaves 23 and 24, 90 deg., taking white for raisers and the rest for sinkers, the reverse of what thus far has been explained will be the case, i. e., the filling pushed out of the proper position in order to produce the imitation gauze effect.

MOCK LENOS IN CONNECTION WITH JACQUARD EFFECTS.

An example of such a fabric and its design on point paper is given in connection with Figs. 25 and 26, and of which let us consider Fig. 25 as the actual size fabric sketch and Fig. 26 a portion of this sketch worked out on point paper.

The first point to take into consideration is the width of one repeat of the design in

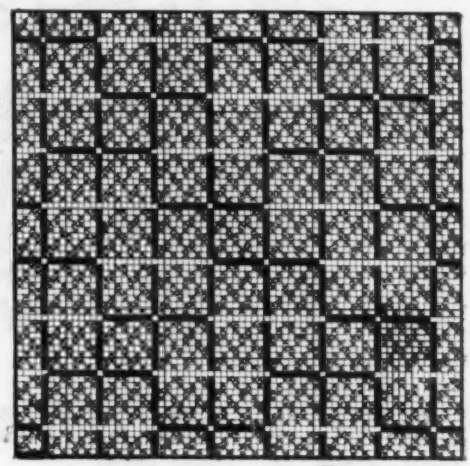


Fig. 24

the fabric sketch and which in this instance is 3 3/4 inches.

Suppose we have a 600 jacquard at our disposal, using one-half of it for one repeat of the pattern, i. e., cutting the working de-

sign twice over for one repeat of the machine.

Fig. 25

Then we find:

300 ÷ 3 3/4 = 80 ends per inch, warp texture.

The mock leno weave used to be the 6 harness effect, shown in Fig. 1, and to be used for the figured effects in sketch as then shown shaded.

For ground use the common plain weave.

Consequently:

80 ÷ 3 (ends per group in one dent) = 26 2/3 or practically 27 dents for leno reeding are required per one inch.

Leaving one dent empty between each group will thus give us (27 × 2) = a 54 reed as the one to use.

300 ÷ 6 (repeat of mock leno weave used) = 50, i. e., the mock leno weave will repeat in number of hooks used for the repeat of the pattern, a feature which, however, in connection with the present design (mock leno being used for figure effect), is of less importance since warp ways in the present instance it does not refer to an all over effect, as would be the case if mock leno was used for ground.

300 ÷ 2 (repeat of plain weave) = 150, i. e., shows that the weave as used for the ground work of the design, repeats properly, i. e., connects from one repeat to the other.

Examining our fabric sketch filling ways, we find the same to be 4-13/48 of an inch long, and

4-13/48 × 80 = 341-2/3, or practically speaking, 342 picks are the calculated picks for the design on point paper, and

342 ÷ 6 (repeat of mock leno weave) = 57, i. e., shows that we can use this number of picks in the complete working design for the reason that 342 is a multiple of 6; although in the present instance, the mock leno weave being used for figure effects, it would not have made much inconvenience, one way or the other, as long as we would have used an even number of picks, for the fact that the mock leno weave is used for the figure effect, i. e., for broken up effects, and not for the ground weave, and where the repeat of the weave has to be taken into consideration, the same in this instance being the plain weave, and which repeats on any even number of picks.

We have referred more particularly to taking the mock leno weave into consideration with reference to laying out the working design, for the reason that the case might be reversed any time and the mock leno referring to ground work, and when the same has to be taken into consideration when laying out the number of hooks and cards to use, and when then both must always be a multiple of the respective mock leno weave used.

Fig. 26 shows a portion of the working design, carried out on the regular point paper, selecting for this purpose the portion of the fabric sketch as outlined, in order to show up the most important portion of the sketch worked out on point paper.

Examining said outlined portion of the sketch, we find the same to be 2-1/12 inches wide, and

3-3/4 : 300 :: 2-1/12 : ×

300 × 2-1/2 = 625, and

625 ÷ 375 = 166.6, practically 167 warp threads and

167 ÷ 8 = 20 heavy + 7 fine squares, this being the number of squares (i. e., warp threads) used in our portion of the working design given.

The length of the portion of the sketch outlined is 2-21/32 inches, and using 80 picks per inch in the fabric (the same as for warp texture) we find

2-21/32 × 80 = 212 picks required to be taken up = 26-1/2 heavy squares of the point paper.

These later calculations are given for two purposes:

(1) To show the student that the portion of the design shown on point paper is executed in exact proportions to the actual working design, and

(2) As a special lesson how to proceed with his calculations any time when laying out the sketch for any working design on point paper (no matter what system of designing), size of jacquard machine and texture of cloth being given.

With reference to working design on point paper, we refer to 300 hooks, in order to show up as large a portion of the design as possible on the page, it being readily understood that if the effect of the sketch in Fig. 25 can be shown up on a larger scale in the woven fabric, in turn referring to a larger number of hooks used, will permit a more pronounced execution of the design in the fabric, having then more warp threads and picks in proportion for every detail of the design of the sketch at our disposal. This is in the present instance of so much more

importance, for the fact that it always takes a couple picks and warp threads when changing from one effect to the other effect, i. e., from ground to figured work or vice versa, or what means the same, from mock leno weaving to regular weaving or vice versa,

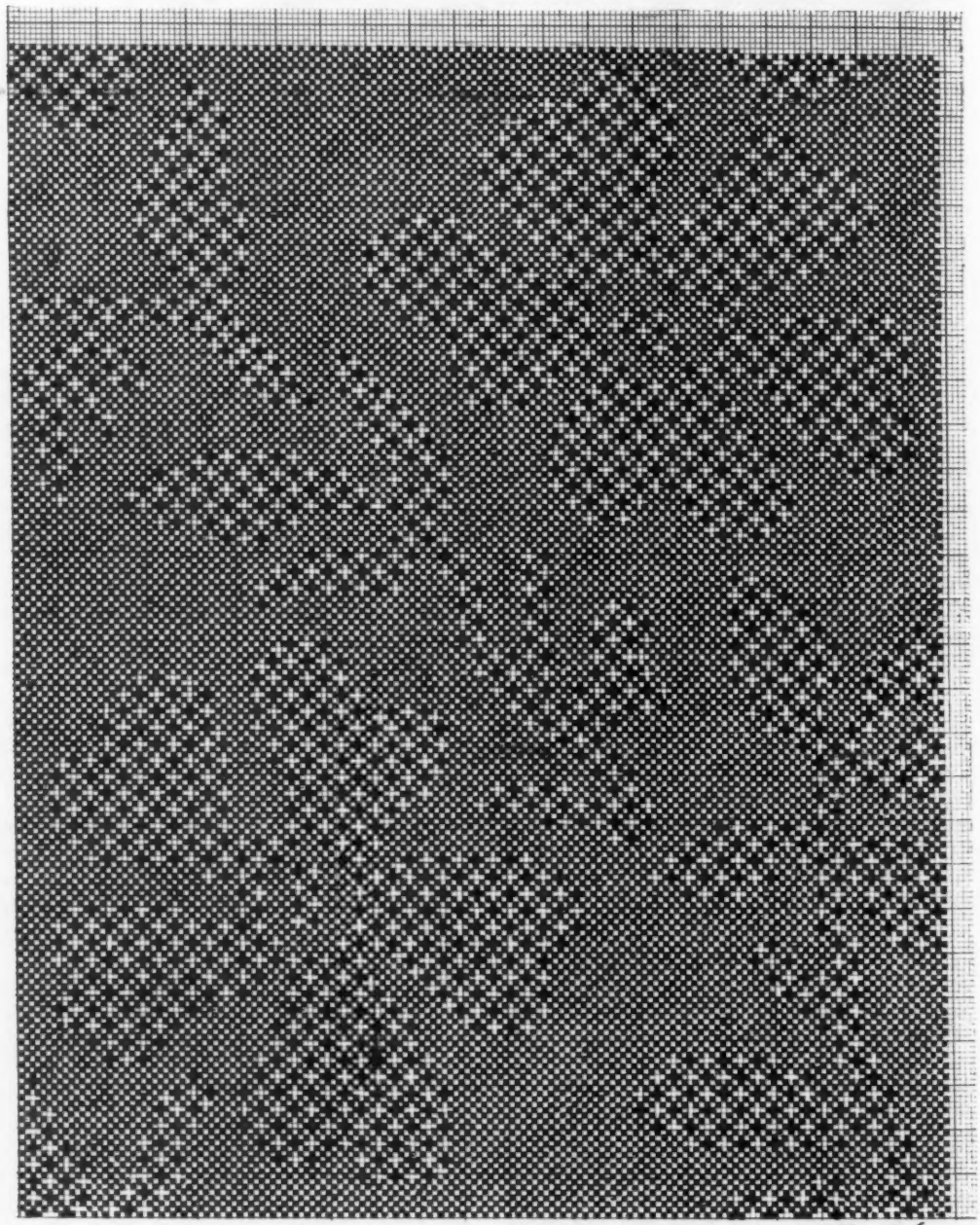


Fig. 26

before the threads (warp and filling) take their proper places on the structure. How-

ever, sketch and design given will clearly show the student how to proceed in the matter, for the fact that the larger the effect, i. e., the bolder the figure, the easier the designing. In the same manner if dealing with a coarser texture used, it will then permit us to leave two dents empty in place of one, in this way also bringing up the change from mock leno weaving to regular weaving more prominently; using in our example the combination between sketch and the working design, more particularly for guiding the student how to proceed to figure out the size of design, etc., from a given sketch, whereas otherwise we would have had to mention that sketch given is reduced with reference to actual size in fabric, making it in turn harder for the student to figure for his example.

A NEW SPINDLE DRIVE FOR SPINNING MACHINERY.

The same consists of means for applying a very high speed to the spindle without com-

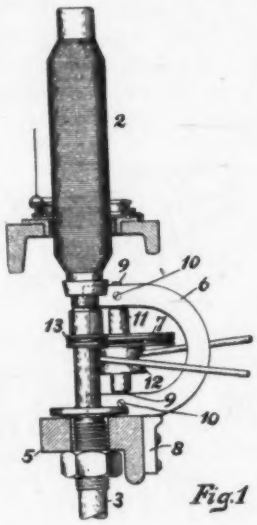


Fig.1

plicating the general construction of the frame on that account, the new drive being readily added to any make of spinning frame in use.

With reference to illustrations, Fig. 1 is a perspective view of the drive, showing also in section those parts of a spinning frame to which the mechanism more particularly refers.

Fig. 2 is a plan view of the mechanism as shown in Fig. 1.

Numerals of reference accompanying the illustrations indicate thus: 1 the spindle, which in turn carries the bobbin 2 latched into the spindle bolster 3 by means of latch 4. 5 indicates the spindle rail, upon which the bolster 3 is mounted, and through which the spindle 1 passes. The spindle rail 5 has also mounted upon it a yoke piece 6, which forms the bearings for the power disk 7, it being fastened to the spindle rail 5 by means of screws 8.

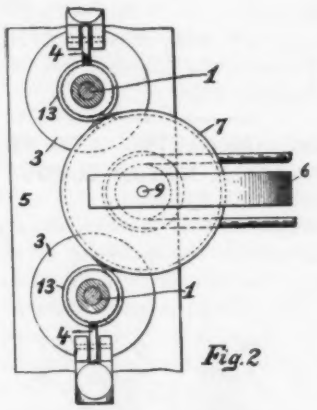


Fig.2

In each end of the yolk piece 6 is a centring pin 9, having a conical point and held in proper place by means of set screw 10, which allows the pins to be adjusted for wear.

The power disk 7 has an axle 11 passing through its centre, the ends of which are recessed (not shown) cylindrically, for the reception of small steel balls, which engage both the walls of the recessed portion and the conical end of the pins 9, in this way reducing to a minimum the friction between pin and axle. Upon the axle 11 is also fastened a whirl 12, which has a cord or band running from it to the tin roller as extending throughout the length of the machine, being the means by which power is applied to the spindles.

Two spindles 1 are driven from one power disk, each spindle being provided with a whirl 13; the spindles 1, whirls 13 and power disk 7 being so located in relation with each

other, that a belt may be passed around the power disk 7 and whirls 13, in such a manner that the power disk will rotate both spindles in the same direction. As seen in the illustration the belts are crossed, in this way embracing the whirls and power disk very completely, in turn preventing slippage of the belt, which would result in waste of power and speed.

It will also be seen that power disk 7 is considerably larger in diameter, than the diameter of whirls 13, the diameters of the whirls and power disk influencing the speed of the tin roller.

The power disk 7, by referring to Fig. 2, is shown out of centre line with the spindles. However, said disk, if so desired, may be placed between the spindles, but using in this case a smaller disk.

RUBBING, BREAKING AND POLISHING SILK MIXED GOODS.

The object of this process, as carried on in connection with the finishing of silk or silk mixed goods, consists in imparting to the fabric the characteristic smooth lustrous

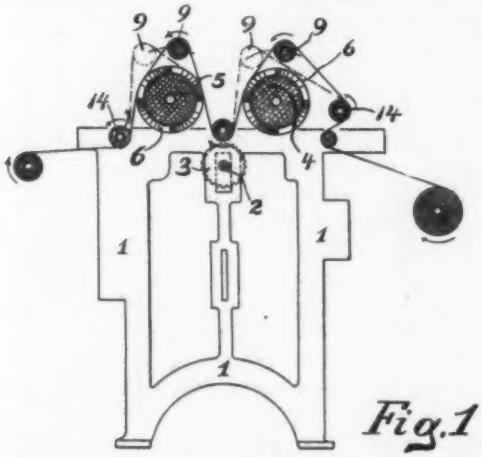


Fig. 1

finish, free from any imperfections caused to the fabric by the material used in its construction during weaving, etc. Special machinery is used in the finishing room for accomplishing this result, an improved construction of such, by A. Gerter of Paterson, being shown in the accompanying illustrations, of which Fig. 1 shows the machine in its vertical section, clearly showing the arrangement of the various rollers, spreaders, knives, and tension device, the mode of operating the same, and how the fabric is passed through the machine from the supply to the take-up roll. Fig. 2 is a detail view of a roller carrying a set of knives having a wavering or broken edge. Fig. 3 shows the method of operating the tension rollers.

The mechanism of the new machine consists first in providing tension-bars which are rotated in the same direction in which

Fig. 2

the fabric is traveling at the same time employing means for quickly and effectually regulating the tension of the fabric as desired; second, providing knife-carrying rollers of such construction and arrangement so as to materially assist in rubbing, breaking and polishing the fabric under operation, and removing imperfections, and, third, to provide means for spreading the fabric and at the same time removing imperfections therefrom. A fourth object is to provide a knife of a peculiar construction, as well as spreaders and polishers that are not station-

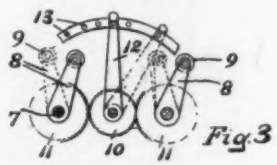


Fig. 3

ary nor driven and rotated by the friction of the moving fabric, but are rotated from another source. A fifth claim of the new machine over those now in use, is an increase in production with a corresponding decrease in time and labor required, hence less cost for finishing a given quantity of cloth.

A description of the construction and operation of the new machine is best given by quoting numerals of reference accompanying our illustrations and of which 1 indicates one of end frames (heads) of the machine upon which is mounted the main driving shaft, 2, which has secured to it a driving pinion, 3, for the purpose of driving a series

of rollers. In Fig. 1 the intermediate gears are omitted so as to avoid confusion. Four and 5 indicate the knife carrying rollers, which are each provided with four dull edged knives, 6, the knives on the roll, 4, being arranged to run in a left hand direction while the knives on roller, 5, are run in the opposite direction. The edges of the knives, 6, are of a discontinuous or broken edge, for the purpose of gripping the fabric more effectually than if they were all of a straight, continuous edge.

Upon the ends of the shafts, 7, of the knife rollers, 4 and 5, are mounted swinging lever-arms, 8 (see Fig. 3), they being provided at their upper ends with loosely mounted rotatable tension rolls, 9, for the purpose of putting tension upon the cloth, the amount of tension given being regulated by means of the gear, 10, which in turn meshes with the gears, 11, the rotation of the same being governed by means of a lever, 12, and its gear, 10. The lever, 12, can be secured to any of the positions, 13, so as to maintain the desired tension upon the fabric. Numeral of reference, 14, in connection with diagram, Fig. 1, indicates ordinary spiral threaded rolls, each of which is reversely threaded, i. e., having the threads on one-half of the roll running in one direction, and on the other half in the opposite direction, thereby tending to continually spread the fabric in its width, a feature which in turn will tend to remove wrinkles, knots, loose threads and other inperfections from the surface of the fabric treated.

It may here be mentioned that the degree of tension put on the fabric under operation is not limited to the extent of movement, as shown by the dotted position of the rollers, both in Figs. 1 and 3, but that they may be moved farther to the right or left, depending upon how much of the fabric is to be submitted to or freed from the action of the knives, 6.

On account of the rollers, 9, being smooth and at the same time revolving in the arms, 8, they thereby assist in polishing as well as regulating the tension put on the fabric, at the same time governing the extent to which the latter is subjected to the knives, 6, of the roll, 4, which is driven at three times the speed of the fabric and in the same direction, while the rolls, 14, are driven only twice the speed of the rollers, 4. The main shaft of the machine is driven in the usual manner, it in turn driving, in connection with intermediate gears, the knife rollers, etc., as before referred to.

WORSTED YARNS.

(Continued from May.)

The French system of drawing is different from the English system. In the English system, as previously explained, through the process of winding the sliver or roving on the bobbins, some twist is put in through the process, again it is necessary to use oiling of the product by this system, both being features not necessary in connection with the French system of drawing.

Although the principle of the French drawing is different, at the same time the mode of multiplying, i. e., doubling the slivers and drawing them in one of less dimensions than one of those fed, is identical, as mentioned before. The principle of French drawing is to put no twist into the slubbing or roving, thus keeping the fibres as straight and parallel to each other as possible. This procedure requires different machinery from that used for the English drawing system (open and cone drawing). The balls or tops made on the comb are mixed in the usual way, in a can gill box. The cans of sliver produced are next put up, two ends together, in the rear of the first drawing frame, the ends are fed into the back rollers, and in turn passed between the front or drawing rollers which draw them out. Between both rollers is a porcupine roller (revolving the least bit faster than the back rollers) over which the sliver passes, i. e., being drawn through its pins. This porcupine roller acts only as a carrier for supporting the wool between the back and front rollers and prevents the yarn from getting twitty by holding the slivers when the front rollers are drawing. The drawn out sliver when leaving the front or drawing rollers, is next passed between two rubbing leathers, similar to those used for condensers of the roving in woolen carding, which rub all its fibres together, without put-

ting any twist into it, hence in this system of drawing, a round sliver is produced, compared to the flat or open sliver produced by the English system. The round slivers produced by the condensers of the French drawing frame are next passed through a guide wire and wound on to a horizontally placed wooden bobbin traveling at a good speed end-ways, thus causing the end to keep crossing backwards and forwards.

This principle of doubling and elongating the slivers is repeated successively in three or more machines, being nothing but a repetition of the previously explained drawing frame. Every succeeding operation still further reduces the sliver in thickness. To illustrate this method of drawing Fig. 2 is given. Letters of reference in illustration indicate as follows A B, back rollers; C D,

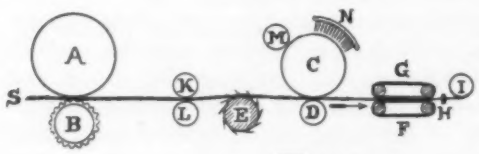


Fig. 2

front or drawing rollers; E, porcupine roller; F G, condenser; H, guide wire; I, bobbin; K L, carrier rollers. Examining illustration, we find that the upper situated roller in both, the back and front roller set (A and C) have a larger diameter compared to their companion rollers (B and D). The work to be performed by rollers A and B, consists in pressing the sliver, S, to permit its drawing out by means of the front or drawing rollers, C D respectively, by the porcupine roller, E. Roller A will act as a press roller by means of its own weight, and in order to insure perfect work (pressing of the sliver) roller B is fluted. Rollers C D are both smooth and covered with parchment paper. The pressure of roller C gets increased by means of weights and springs. The small roller, M, has for its object to apply the loose paper cover to the roller C, and brush N, is placed there for the purpose to keep roller C constantly clean. To give a clear understanding of the workings of the back, porcupine and front rollers (leveling or straightening fibres) illustration Fig. 3 is given. In the same: A represents the feeding or back rollers; C, front or drawing rollers, with B, the porcupine roller; S, the sliver as fed to the back rollers, and X, the sliver as leaving the front rollers after having been subjected to the action of the porcupine roller, B.

After leaving the finisher drawing frame, the now greatly reduced sliver is submitted to the action of the roving frame, which machine continues the work of doubling (two ends together) and elongating the slivers, the product of the machine being now a fine sliver termed roving, and which in turn is ready for spinning on the self-acting mule instead of on the throstle as in the English system.

Either system has its advantages, the English system produces a somewhat more com-

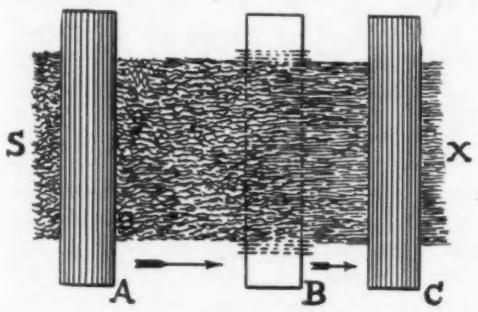


Fig. 3

pact worsted thread, which in turn is more adapted for fabrics where firmness of structure is a matter of importance, for example, worsted suitings and trouserings, i. e., fabrics for men's wear, i. e., fabrics of a high order of lustre and strength; whereas the French system produces the best material for dress goods, hosiery, etc., i. e., fabrics where a certain loftiness in its structure is of advantage to it.

We now come to the spinning of the roving, and which for the English system is done either by means of the flyer, cap or ring frame, whereas in connection with French drawing, i. e., French spinning, it is done on the self acting worsted mule.

Thus we actually have four ways of spinning worsted, viz.: flyer, cap, ring and mule.

Flyer spinning is the slowest method, still it is well adapted for heavy counts of yarns,

as well as the spinning of mohair, which requires special care and slow speed, owing to its tending to separate while working, as it has no felting qualities, and is quickly affected by electricity. There is always more or less trouble in connection with flyer or throstle spinning from the formation of a fringed beard around the top of the bobbin, as they become filled with yarn, a defect which, however, can be overcome by shaping the bobbin so that more room can be left at each end of it, giving in turn a shape to the bobbin with a larger circumference in the middle portion than can be got by the ordinary motion of the traverse.

Cap spinning is most generally used for spinning fine yarns, or yarns intended f twisting, down to 12s. This frame is constructed almost on the same principle as the flyer and ring frame, the difference being in the spindles and form of giving twist.

On a cap frame the spindles are fastened into the upper part of the lower rail. On the top of the spindle is placed the cap, which, like the spindle, is stationary. The cap serves a dual purpose. The bottom of the rim of the cap guides the yarn as it is wrapped on the bottom part of the bobbin, whereas the top part of the cap serves as a shield for the upper portion of the bobbin, so that the thread in its passage from the rollers is prevented from coming in contact with the bobbin and making rough threads.

The spindles and cap are fixed, whereas the tube to which the bobbin is attached rotates; thus the bobbin, by its own speed, puts in twist and winds on at the same time.

The threads during the process, i. e., in the act of twisting, have a tendency to fly out on account of the centrifugal force, and for which reason the machine is supplied with shields to keep the threads from mingling with each other, and thus breaking. This is more particularly the case when dealing with low counts of yarns, and for which reason cap spinning is more satisfactorily confined to the production of higher counts of yarn.

The shields, or as they are called, separators, of the machine must be kept smooth and free from dirty oil, and worn out bobbins must be dispensed with, since they are a source of much waste and trouble.

The cap frame can be run at a high speed, hence the large production of the machine, and on fine counts of yarn good yarns are obtained at less cost for spinning than in many other forms. The spindle in a given time will produce nearly, or quite double the amount of yarn that a flyer will yield in the same time.

The ring spinning process for worsted yarns closely resembles the one for cotton yarns. In a ring frame, unlike the cap frame, the spindles revolve, and the bobbin receives its motion from the spindle; also the bobbin (as in the cap and flyer frames) does not move up and down. The ring rail is the lifter. The ring is the most important piece of mechanism in connection with this system of spinning. It must be free from every defect and perfectly true. It has a flange top and bottom. On the top flange the "traveler" is placed. It is a small semi-circular wire of the finest tempered steel, the ends slightly closed together, so that a small pressure is required to force it into its place on the ring.

A traveler clearer is used for the purpose of removing any fibre that may cling to the traveler and impede its progress, thereby increasing the drag on the thread. In the operation of ring spinning the roving is passed under the traveler, and as the spindle revolves the yarn is twisted round and round with great velocity. The bobbin and spindle do not vary in speed, so that in this respect there is a difference from the throstle form of spinning, where the bobbin has the great defect of increasing in speed as it gets heavier with the wound on yarn, though this defect is not entirely dispensed with in ring spinning.

As the bobbin fills, the speed of the traveler changes slightly, and its object being to wind the yarn on to the bobbin, it most certainly affects the drag in proportion to the speed at which it has to travel. The greater speed the more drag for a given traveler, and its size, of course, governs the arrangement; the larger it is, the more power or force the yarns need to pull it round. By reducing the size of a traveler, the drag becomes light, and in fine counts this drag can be regulated to a certain extent, giving in turn a decided advantage over the cap and flyer frames.

The worsted mule, also called the self act-

ing mule, is used in connection with French spinning, the drafting of the roving before delivering it to the spindle being done on the same principle as in the English system, only to a greater extent, since the open condition of the French roving, as before referred to, permits a greater draft to be made on the mule. For fine work, the self acting mule may consist of five hundred to six hundred spindles, and the spinning is very similar to the same operation of a self acting mule for woolen yarn spinning. There is, however, this difference. In the spinning of woolen yarn, the roving to be spun is all delivered by the time the carriage has completed, say, half its run, the other half of the run being devoted to drafting the thread or roving. The carriage having reached its extreme run, stands a short time before returning, until the spindles which continue running have given the yarn the necessary twist. In the French worsted spinning, the drafting and twisting are continuous as the carriage runs out, and unless there is to be extraordinary twist in the thread, the carriage immediately returns as soon as the limit of the outward run has been reached. In both cases the yarn spun at each stretch of the mule is automatically wound on the bobbin on the return trip. The bobbins or cops, as they are now termed, average from four to six inches in length, depending on the count of the thread, very fine counts requiring the smallest bobbins.

Yarn thus produced, either by the English or French systems, is now in a single thread, and in which condition in some instances it is used in the loom. For example, the cop as produced on a mule may at once be used in the shuttle as filling; whereas for warp yarns, and where a greater strength is required, two of the ends are generally twisted together with sufficient twist to give it the desired effect. In some instances, for fancy yarns two singles of different colors are twisted together, whereas in other instances, two ends of the same wool are twisted.

In some instances the wool fibre is dyed previous to carding and combing, whereas in other instances it is run through the worsted process in its natural state, the twisted yarn afterwards being dyed in the hank to the required shade, in this way saving a variety of new lots to be made for a certain count of yarn, since in that instance only the required weight of yarn made is dyed a required color, in turn saving lots of yarn to be kept on hand, as compared to dyeing in the wool, to the mill.

(To be continued.)

THE CURTIS AND MARBLE LAPPET SHEARING MACHINE.

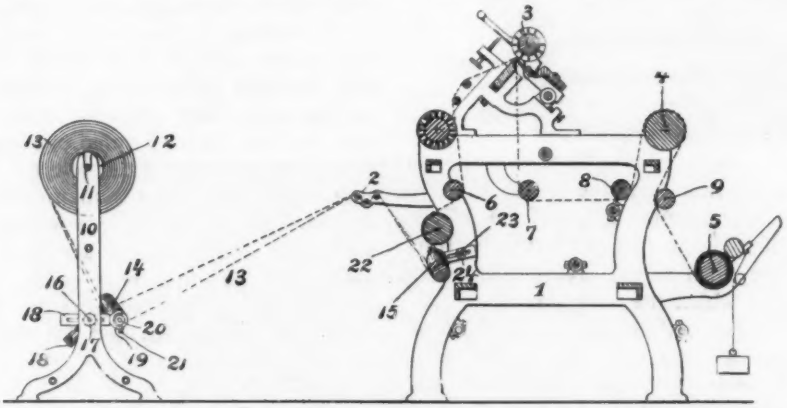
Lappet shearing, as the name indicates, is quite different from regular shearing, for the fact that lappet shearing consists in the process of removing the loose threads, commonly called "bridges," from the back of lappet fabrics. These bridges extend from one figure to another and occur in any relative position or lie in any direction from transverse to longitudinal in different pieces of cloth or at different inclinations upon the same piece of goods, in turn requiring for the proper shearing of all the bridges two or more runs of the fabric through the machine with the fabric skewed or twisted each time at a different angle, either right or left or both right and left successively, in order to raise or throw up the bridges for the purpose of shearing, in some instances requiring different modifications of the twist at different parts of the same piece of goods.

It is the purpose to provide by means of this machine a convenient, simple, and efficient way for supporting a cloth-roll and directing the lappet fabric therefrom to the shearing mechanism, also for imparting, controlling and changing the nature and degree of twist in the fabric, in this way raising the bridges and bringing the latter more prominently into position, so as to be properly presented to the shearing-blades of the lappet-shear without liability of wrinkling the fabric while it is run through the machine.

In order to show the method in which the skew or twist is put to the fabric to be sheared, the accompanying illustration is given; and which represents a longitudinal sectional elevation of a lappet shear with the improvement added thereto, also showing the run of the cloth through the machine. In the illustration, numerals of reference indicate thus: 1 indicates frame of the machine:

2 the front tension devices which consist of rods, around which the cloth travels; 3 are the shearing cutters; 4 a draft roll which pulls the cloth through the machine; 5 is the receiving roll upon which the sheared cloth is wound; 6 7, 8 and 9 are small guide-rolls for guiding the cloth in a parallel direction through the machine after leaving the nip of the shear-blades.

Ten shows a support or stand for carrying the unsheared roll of cloth, and which stand is portable or unattached and consequently can be placed at any desired position in front of the shearing machine. This stand is provided with bearings for the reception and support of the axles, 11, of the cloth-roll, 12,



upon which the fabric, 13, to be sheared, is wound preparatory to the shearing operations. On the stand, 10, and also on the front of the shearing-machine frame is provided an adjustably-mounted skewing or skew-guiding roll, as at 14 and 15. These skew-guiding rolls have their journals or axle-mountings arranged in such a manner so as to permit adjustment of the roll to different degrees of angularity in relation to the transverse axial alignment of the stand, or its supporting-frame, by a radial extension or contraction in the length of the carrying means.

For supporting the skewing-roll, 14, and allowing of its adjustment, there is employed at each end of the roll, and secured to the upright frame or stand by a clamp-bolt, 16, and nut, 17, a longitudinally-slotted arm, 18, carrying at one end a swiveling piece, 19, in which the journal-box, 20, is pivotally supported by studs, 21, to rock or swivel in a transverse direction or crosswise to the pivotal movement of the swivel member, 19, the axis of the latter member being longitudinal with the arm, 18.

The clamp-nut, 17, is usually provided with a flange or hand-wheel grip as a convenient means for its operation.

At the front of the shearing-machine frame, near the friction-roll, 22, is provided a similar skewing-roll, 15, which acts on the fabric as it passes from the front tension-guides, 2, to said friction-roll. This secondary skew-roll is mounted in the same manner as the one on the stand, 10. The roll, therefore, can be positioned at any desired inclination in relation to the parallel of the front tension-guide, 2, and friction-roll, 22, the clamping centre bolt being at 23 and controlled by the hand-nut, 24.

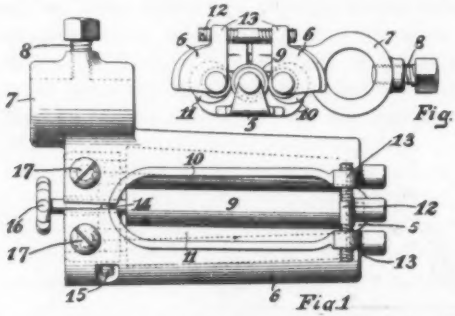
From the foregoing explanation it will be readily understood that the stand can be placed in any position in front of the shearing machine, and the skewing rolls can be adjusted to any desired degree of angularity, in this way assuring proper shearing of the bridges from the lappet cloth.

The plain calico trade is said to be stationary. Taking the total trade of the United Kingdom the production is, perhaps, about the same as it was ten or twelve years ago, notwithstanding the increase of population. —British Tariff Commission.

A NEW LOOM TEMPLE.

This temple of the Crompton & Knowles Loom Works is more particularly adapted for use in connection with fine open work fabrics, for instance gauze, it preventing the liability of tearing or displacement of the threads, which will happen in connection with the use of bur-points as on the ordinary temples.

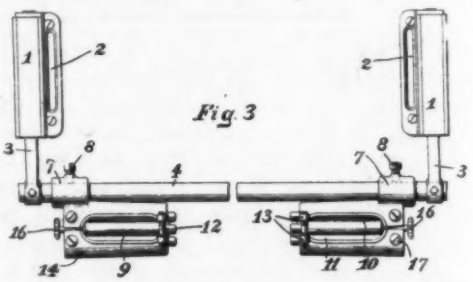
In connection with the use of the new



temple, the stretching of the fabric is done by means of the peculiar shape of the rollers between which the woven cloth travels from the fell of the cloth to the breast beam, and the position in which they are placed.

In order to give a thorough explanation of the construction and working of the new temple, the accompanying illustrations are given and of which Fig. 1 is a plan view of the left hand temple as used in a pair of temples on a loom; Fig. 2 being an inner view of the same. Fig. 3 is a plan view of a pair of these temples as mounted upon the breast beam of a loom, the centre portion being shown broken away.

With reference to numerals of reference accompanying the illustrations, the same indicate thus: 1 shows the casing, which is provided with a slotted flange, 2, for attachment to the breast-beam of the loom. A shank, 3, one at each side of the loom, projects from the end of the casing, 1, it being held under tension of a coiled spring contained within said casing. The shanks, 3, carry between them the temple bar, 4, both temples being mounted upon the latter and adjustably held in proper relation to the width of the fabric woven. Each temple consists of two jaws, and of which 5 is the lower jaw and 6 the upper jaw. The upper jaw, 6, is provided with a projecting lug, 7, through the centre of which the temple bar, 4, passes, it being adjusted thereon by means of a set screw, 8. In the lower jaw, 5, a cylindrical roller, 9, is provided, resting in suitable bearings, the upper jaw, 6, being provided with two conical rollers, 10 and 11, the three rollers when in proper position having their axis in the same horizontal line, the cylindrical roller, 9, fitting snugly between the two conical rollers, 10 and 11, the surface of the roller being in perfect contact with each other. The adjustment of the tension between the rollers is accomplished by having the upper jaw, 6, divided lengthwise into two separate pieces, each one forming a bearing for one of the conical rollers. The inside ends of these pieces are adjustably fastened by means of a small shaft, 12, having oppositely threaded ends, which fit into the lugs, 13, as formed one on the upper side of each piece of the jaw 6. The other end of the jaw, 6, is also provided with a similar shaft, 14, which by turning will bring the outer ends of the two conical rollers toward or away from each other, in this way securing the proper adjustment, the end of shaft, 14, being provided for this purpose with a screw slot, 15.



The axle of the cylindrical roller projects somewhat from the outer end of the temple, and is provided with a thumb screw, 16, for the purpose of turning the cylindrical roll for sake of adjustment. The jaws 5 and 6 are connected by means of screws, 17, the direct contact of the jaws occurring only at this end, the other end being separated by sufficient space to permit the free passage of the fabric between said jaws, the course of the fabric being under the two conical rollers,

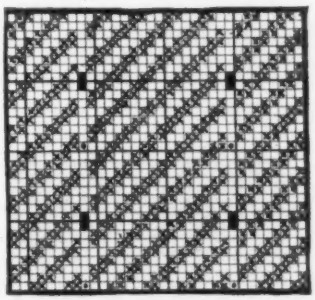
10 and 11, and over the cylindrical roller, 9. It is necessary in the handling of cloth for which these temples are constructed, that the rollers be clothed with the material capable of exerting a firm pressure without crimping, twisting or breaking the fabric. Rubber has been found for this purpose the most preferable, said rollers being covered by stretching a piece of rubber tubing over them, in this manner making it possible by accurately adjusting the rollers, to handle the most delicate fabric without the least injury.

FOREIGN NOVELTIES.

Piece Dye "Duster Cloth."

Complete Weave. Repeat 80×30.

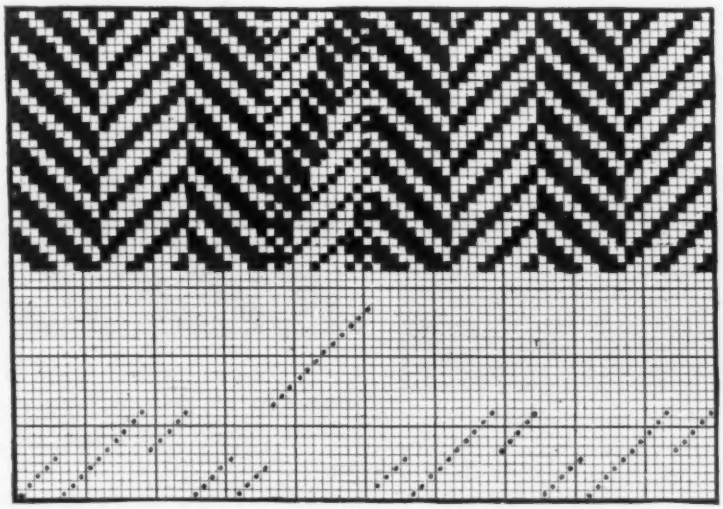
Warp—4650 ends, 2/28s worsted, in the gray twisted over with a cotton thread. 22 harness fancy draw.



2 ends, 2/32s worsted, black.
4 ends, 2/32s worsted, medium blue.
2 ends, 2/32s worsted, black.
1 end, 2/32s worsted, red, (fancy)
2 ends, 2/32s worsted, black.
4 ends, 2/32s worsted, medium blue.
2 ends, 2/32s worsted, medium green.
2 ends, 2/32s worsted, black.

17 ends, in repeat of pattern.

Reed—16 { 1 dent @ 4 ends, / 1 dent @ 5 ends, / 2 dents @ 4 ends, } =5¼" wide in loom; or use Reed No. 32, using respectively 2 and 3 ends per dent.



Reed—21×4=55½" wide in loom.

Filling—65 picks per inch, single 18s worsted in the gray.

Finish—Scour well, clip or shear, press, 52" finished width.

Figured Dress Goods.

Complete Weave. Repeat 17×16.

Warp—3460 ends, 17 harness straight draw, or 6 or more harness fancy draw, arranged thus:

Filling—62 picks per inch, arranged thus:

2 picks, 18s worsted, black.
4 picks, 18s worsted, medium green.
4 picks, 18s worsted, black.
4 picks, 18s worsted, medium blue.
2 picks, 18s worsted, black.

16 picks in repeat of pattern.

Finish—Scour well, singe, press. 48" finished width.

Cheviot Dress Goods Suiting.

Complete Weave. Repeat 136×136.

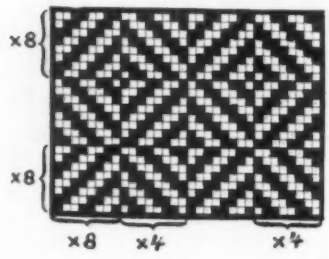
Warp—2260 ends, 8 harness fancy draw

Reed—20×2=56″ wide in loom.

Dress—

34 ends, 2/14s worsted, gray and black twist.
1 end, 2/24s worsted, green twist.
7 ends, 2/14s worsted, gray and black twist.
1 end, 2/24s worsted, black and red twist.
93 ends, 2/14s worsted, gray and black twist.

136 ends in repeat of pattern.



Filling—37 picks per inch, arranged thus:

34 picks, 2/14s worsted, black twist.
1 pick, 2/24s worsted, green twist.
7 picks, 2/14s worsted, black twist.
1 pick, 2/24s worsted, black and red twist.
93 picks, 2/14s worsted, black twist.

136 picks in repeat of pattern.

Finish—Cheviot finish, 50″ wide.

Worsted Suiting.

Complete Weave. Repeat 144×9.

Warp—8200 ends, 12 harness fancy draw.

Reed—16×8=64½ inches wide in loom.

Dress—

18 ends, 2/60s worsted, peacock blue.
30 ends, 2/60s worsted, black.

48 ends, repeat of pattern.

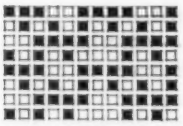
Filling— 100 picks per inch, arranged thus:

2 picks, 2/60s worsted, peacock blue } × 4= 12 picks
1 pick, 4 run black, backing }
1 pick, 2/60s worsted, peacock blue = 1 pick
1 pick, 2/60s worsted, black = 1 pick
1 pick, 4 run black, backing = 1 pick
2 picks, 2/60s worsted, black } × 7= 21 picks
1 pick, 4 run black, backing }

Repeat of pattern: 36 picks

Finish—Worsted finish; 56 inches wide.

Worsted Trousering.



Complete Weave. Repeat 6×4.

Warp—4260 ends.

Reed—22½×3=63″ wide in loom.

Dress—

1 end, 2/32s worsted, pearl }
1 end, 2/32s worsted, black } × 6= 18 ends
1 end, 2/32s worsted, dark gray }
1 end, 2/32s worsted, pearl = 1 end
1 end, 2/32s worsted, black = 1 end
1 end, 2/64s worsted, blue, twisted with 2/120s pearl mercerized cotton = 1 end
2 ends, 2/32s worsted, black = 2 ends
1 end, 2/64s worsted, blue, twisted with 2/120s pearl mercerized cotton = 1 end
1 end, 2/32s worsted, pearl }
1 end, 2/32s worsted, black } × 6= 18 ends
1 end, 2/32s worsted, dark gray }
1 end, 2/32s worsted, pearl = 1 end
1 end, 2/32s worsted, black = 1 end
1 end, single 32s worsted, black, twisted with 2/80s pearl mercerized cotton = 1 end
2 ends, 2/32s worsted, black = 2 ends
1 end, single 32s worsted, black, twisted with 2/80s pearl mercerized cotton = 1 end

Repeat of pattern: 48 ends

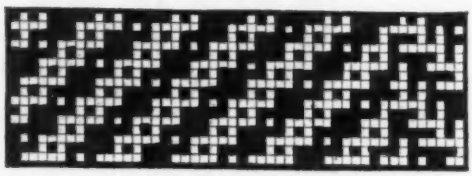
Filling—47 picks per inch, arranged thus:

1 pick, 2/32s worsted, black.
1 pick, 3 run woolen yarn, black.

2 picks. Repeat of pattern.

Finish—Worsted finish, 56 inches wide.

Worsted Suiting.



Complete Weave. Repeat 48×16.

Warp—6300 ends, 16 harness fancy draw.

Reed—11½×8=68″ wide in loom.

Dress—

2 ends, 2/18s worsted, black...
2 ends, 2/24s worsted, blue and gray twist... } × 2= 8 ends
2 ends, 2/24s worsted, gray and black twist...
2 ends, 2/24s worsted, blue and gray twist... } × 6= 24 ends
2 ends, 2/18s worsted, black...
2 ends, 2/24s worsted, blue and gray twist... } × 2= 8 ends
2 ends, 2/24s worsted, gray and black twist...
2 ends, 2/24s worsted, blue and gray twist... } × 2= 8 ends
} × 3=144 ends
2 ends, 2/18s worsted, black... } × 2= 8 ends
2 ends, 2/24s worsted, blue and gray twist...
2 ends, 2/24s worsted, gray and black twist... } × 6= 24 ends
2 ends, 2/24s worsted, blue and gray twist...
2 ends, 2/20s worsted, light blue and black twist } × 2= 8 ends
2 ends, 2/24s worsted, blue and gray twist...
2 ends, 2/18s worsted, black... } × 2= 8 ends
2 ends, 2/24s worsted, blue and gray twist...

2 ends, 2/24s worsted, gray and black twist.....= 2 ends
2 ends, 2/24s worsted, blue and gray twist.....= 2 ends
2 ends, 2/26s worsted, light blue and black twist.....= 2 ends
2 ends, 2/24s worsted, blue and gray twist.....= 2 ends
2 ends, 2/24s worsted, gray and black twist.....
2 ends, 2/24s worsted, blue and gray twist. ..... × 6 = 24 ends
2 ends, 2/18s worsted, black.....
2 ends, 2/24s worsted, blue and black twist..... × 2 = 8 ends
2 ends, 2/24s worsted, gray and black twist.....
2 ends, 2/24s worsted, blue and gray twist. ..... × 2 = 8 ends

Repeat of pattern: 240 ends.

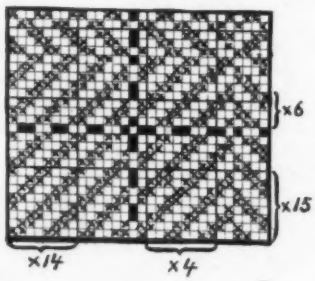
Filling—90 picks per inch, arranged thus:

2 picks, 2/18s worsted, fancy mix.....
2 picks, 2/18s worsted, black. ..... × 3 = 12 picks
2 picks, 2/18s worsted, fancy mix....= 2 picks
38 picks, 2/18s worsted, black.....= 38 picks
} =208 picks
2 picks, 2/18s worsted, fancy mix.....
2 picks, 2/18s worsted, black.. ..... × 3 = ...= 12 picks
2 picks, 2/18s worsted, fancy mix..... .....= 2 picks
8 picks, 2/18s worsted, black.....= 8 picks
2 picks, 2/26s worsted, dark green and black twist....= 2 picks
18 picks, 2/18s worsted, black .....= 18 picks
2 picks, 2/26s worsted, light blue and black twist.....= 2 picks
8 picks, 2/18s worsted, black.....= 8 picks

Repeat of pattern: 260 picks

Finish—Worsted finish, 56″ wide.

Worsted Dress Goods Suiting.



Complete Weave. Repeat 158×158.

Warp—4700 ends, all 2/32s worsted, 12 or 16 harness fancy draw.

Reed—21×4=56″ wide in loom.

Dress—

1 end, green and black twist.....
1 end, blue..... × 4 = 8 ends
1 end, green and black twist.....= 1 end
11 ends, blue .....= 11 ends
} × 2 = 80 ends
1 end, blue and black.....
1 end, blue ..... × 4 = 8 ends
1 end, blue and black .....= 1 end
11 ends, blue .....= 11 ends

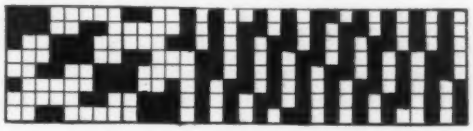
1 end, green and black .....
1 end, blue..... × 4.....= 8 ends
1 end, green and black.....= 1 end
11 ends, blue .....= 11 ends
1 end, blue and black.....
1 end, blue ..... × 4.....= 8 ends
1 end, blue and black. .....= 1 end
9 ends, blue.....= 9 ends
1 end, 4 fold green and black.....= 1 end
1 end, blue.....= 1 end
1 end, green and black.....
1 end, blue ..... × 3.....= 6 ends
1 end, green and black.....= 1 end
11 ends, blue .....= 11 ends
1 end, blue and black.....
1 end, blue ..... × 4.....= 8 ends
1 end, blue and black.....= 1 end
11 ends, blue .....= 11 ends

Repeat of pattern: 158 ends

Filling—75 picks per inch, same arrangement of pattern as used for warp—the blue and black twist and the green and black twist to be the same yarn as used in warp, *i. e.*, 2/32s worsted, however, using single 18s blue worsted in place of the 2/32s blue worsted as used in warp.

Finish—Scour well, shear or single, 52″ finished width.

Worsted Trousering.



Complete Weave. Repeat 32×8.

Warp—5120 ends, 28 harness fancy draw.

Reed—16×5=64″ wide in loom.

Dress—

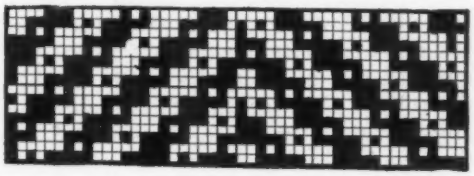
12 ends, 2/36s worsted, drab.....= 12 ends
4 ends, 2/36s worsted, black.....= 4 ends
1 end, 2/36s worsted, slate .....
1 end, 2/36s worsted, drab .... × 6 = 12 ends
4 ends, 2/36s worsted, black .....= 4 ends

Repeat of pattern: 32 ends

Filling—80 picks per inch, 2/32s worsted, black.

Finish—Worsted finish, 56″ wide.

Worsted Cheviot Trousering.



Complete Weave. Repeat 48×16.

Warp—4352 ends, 16 harness, fancy draw, all 2/40s worsted yarn.

Reed—17×4=64 inches wide.

Dress—

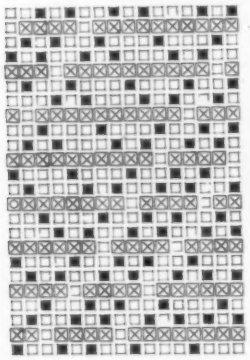
2 ends, black and white twist.....= 2 ends
4 ends, black.....= 4 ends
2 ends, black and white twist.....= 2 ends
2 ends, black and olive twist.....= 2 ends
2 ends, black.....= 2 ends
2 ends, black and white twist.....= 2 ends
4 ends, black.....= 4 ends
2 ends, black and white twist.....
2 ends, black ..... × 3 = 12 ends
2 ends, black and white twist .....= 2 ends
2 ends, black and olive twist .....= 2 ends
2 ends, black.....= 2 ends
2 ends, black and white twist .....= 2 ends
4 ends, black.....= 4 ends
2 ends, black and white twist.....= 2 ends
2 ends, black and blue twist.....= 2 ends
2 ends, black.....= 2 ends

Repeat of dressing: 48 ends

Filling—82 picks per inch, all 2/40s black, worsted.
Finish—Worsted cheviot finish; scour well, shear clear; 56 inches finished width.

Overcoating.

(Cotton warp, woolen cheviot shoddy, (coarse) filling)



Complete Weave.

Repeat 16×24.

Warp—1758 ends, 2/30s long staple cotton.

Reed—12×2=73¼ inches wide in loom.

Filling—42 picks, 4½ cut woolen coarse cheviot shoddy.

Finish—Full to 54 inches wide, rough finish,

A FRENCH SAFETY DEVICE TO THE LAP HEAD OF SCUTCHERS.

In connection with the lap head of scutch ers, the winding up of the lap, as produced by the scutcher, is usually effected by an arrangement wherein the operative of the scutcher has to spread out his hands over the lap roller in order to effect the insertion of the commencement of the coil, in turn running the risk of having his hands caught by the roller. To overcome this danger is the object of the new device, the same effecting the regular coiling of the lap without the operative having to touch the lap roller with his hands.

Of the accompanying illustrations, Fig. 1 shows in side elevation, the new device at rest, i. e., the lap just inserted beneath the lap roller but not yet wound round; sufficient parts of the lap head of a scutcher being also shown in order to more clearly understand the working of the new device. Fig. 2 in turn shows the new device in side elevation in that position in which the end of the lap is coiled around the lap roller.

In connection with the new attachment, a perforated and curved sheet iron plate, a, is provided, the same extending over both winding rolls, b, as well as the lapper roller, c. At both sides of the plate, a, there is fixed a support, d, each support possessing a pivot, e, supported in a hole bored in the frame of the machine so as to permit oscillating of plate, a, about the median axis of the pivots, e, and which oscillation is effected automatically as the diameter of the lap increases. Since actual contact of the cotton lap with the protecting plate, a, must not take place at any moment, oscillation is therefore effected by the upward motion of the bars, f, thus:

Supports, g, attached to the bars, f, by means of the adjustable angle pieces, h, have

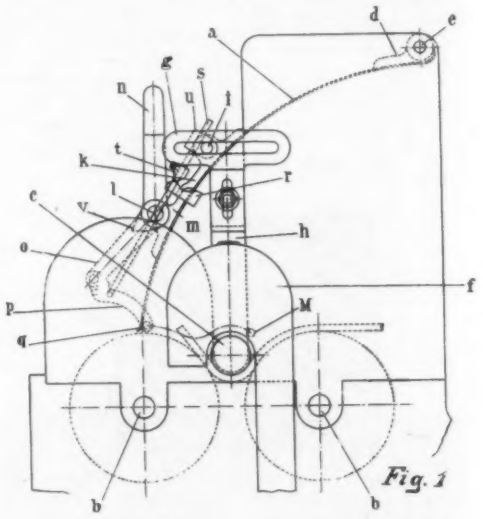


Fig. 1

at their upper ends a horizontal slot which effects the oscillation of the guard plate by means of pivots, i, engaging in them, said pivots being secured to supports, k, firmly attached to the protective plate, a.

The mechanism which effects the insertion of the lap is attached to this plate, a, and consists of the shaft, l, which revolves in two bearings, m, fixed to the edges of plate, a, parallel to the axles of the winding rolls, as well as of the lap roller, c. The shaft, l, can oscillate about its axis, motion being effected by hand by means of the hand lever, n, as is keyed upon the shaft, l. To each end of the shaft, l, is attached a lever, o, which in turn has attached to it a lever, p, having in turn a cross bar, q, attached to them, and which in turn acts directly upon the lap and serves to push the same in by a motion which is indi-

cated in Fig. 1, by the dot-and-dash curve. The outermost point of the stroke of the cross bar, q, is supposed to be at M. Upon the oscillation of the shaft, l, this cross bar, q, moves in the path indicated, being guided by the bars, s, attached to the levers, p. Bars, s, slide in guiding sleeves oscillating upon the pivots, i, and carry the adjustable followers, t, which move in contact with the cams, r.

The operation of the new device is thus: When the lap has been caught and its end appears beneath the lap roller, c (see Fig. 1), the operator of the scutcher presses down lever, n, and consequently turns shaft, l, as well as imparts motion to the two levers, o, and when cross bar, q, effects the motion shown in Fig. 1, whereupon the followers, t, slide upon the

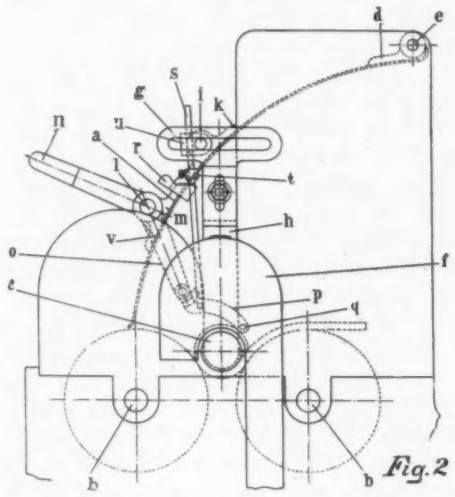


Fig. 2

cams, r, and the rods, s, move in the sleeves, u, since an oscillation thereof takes place about the pivots, i. If now the cross bar, q, moves into the terminal position indicated at M, Fig. 1, then the ring, v, placed adjustably upon the shaft, l, strikes with its projection against the protective plate, a, whereby the turning of the shaft, l, and the motion of the lever system connected therewith are limited. As soon as the lap has been inserted by the cross bar, q, the operator then releases again the handle, n, and then all movable parts of the device simultaneously return into their original position in consequence of the action of the spring, w, while the winding up of the lap takes place.

THE IMPORTANCE OF TENTERING WOOLEN GOODS IN DRYING.

Some manufacturers hold to, that, since stretched woolen goods shrink when said goods are sponged, that most of the folds and other inequalities removed by a thorough tentering during drying would reappear, and that for this reason it is more or less necessary to stretch the cloth in drying; in fact, some woolen manufacturers are opposed to the idea of stretching the fabric in its width more than the finished width required, under the supposition that the cloth then might become too wide. Such a view, however, is erroneous and the mistake of drying cloth with too little tension, or, worse yet, with none at all, usually results in a creased and wrinkled appearance of the thus finished fabric.

Although pronounced wrinkles and creases cannot be removed by a simple stretching of the fabric in its width, since they reappear after steaming, and although it is not possible to make up great differences in the length and width of cloth, which is to be produced at a given finished width, yet the manufacturer may at least be sure, on the other hand, that all less pronounced creases and folds given to the fabric by its twisting during the process of washing and fulling, or other processes, may be removed by a proper stretching of the cloth in its length and width during the process of drying. This is true especially when the cloth is pressed hot in the rotary press and steamed upon the roller. Of course, the stretching in either direction must be considerably more than the difference will amount to after shrinking.

If the cloth is either not stretched at all or insufficiently, the remaining inequalities are practically fixed by pressing and steaming, after which they can be only remedied with the greatest difficulty. Another drying, with great tension and steam lustring immediately following, would be necessary. In the other case, however, if all the smaller in-

equalities and creases are removed by stretching, they can be permanently corrected by pressing and steaming in this smoothed condition. It may, therefore, be accepted as a fundamental rule that all cloth must be perfectly smooth after drying. The subsequent manipulations, such as shearing, brushing, lustring, etc., all require a smooth surface. A wrinkled napped cloth can never be sheared smoothly. Creases, cockles and other like defects will be fixed by steam lustring.

For rough-faced cloth the stretching in drying is considered indispensable. In this case, creases and inequalities cannot be stretched as readily as with napped goods, where the ground has been rendered soft by gigging. It is advisable to shrink goods which are not of a light and loose weave, such as flannels, cheviots, etc., which, in consequence of their character, lose in width during the various stages of manufacture about one inch narrower in fulling, so that in turn they can be stretched well in their width. If a fabric, as will sometimes occur, comes from the fulling mill slightly too wide, it may in turn be stretched somewhat more in length, so as to make it narrower and smooth in its width. Generally speaking, it is advisable, with certain exceptions, to stretch the cloth, especially that which is not to be gigged, from 4 to 5 per cent. more in length and from 2 to 4 inches in their width than their finished width required, obtaining in this way a fabric presenting a smooth face when finished, provided creases and cockles are not too pronounced. If the latter is the case, it is well to wrap the pieces in a dry state and well stretched in their width firmly upon rollers and immerse them for a few hours first in hot and then for the same length of time in cold water. Unwrap them when thoroughly cold and dry them again.

To be sure that a proper amount of stretching is imparted to the fabric, the operator must carefully measure the width of each piece, and in turn assort them as to their different widths. It is more advisable to stop the drying process oftener, on account of having to adjust the width of the machine to suit the width of fabrics under operation, than to mix wide and narrow pieces and in turn dry some of them with insufficient tension. Light textured or very loosely constructed fabrics and which lose in their width by the operations performed on them in a dry condition, such as shearing, brushing, etc., are stretched correspondingly wider, and under some circumstances, as much as from 4 1/2 to 5 1/2 inches.

Goods to be steam-lustred must also be well stretched previously, because a smooth surface can only be obtained in this manner. It is well known that the opportunity is offered in drying before steam-lustring to regulate the proportions of the width of a fabric according to circumstances. If, for instance, the affair refers to a finer class of fabrics, for example, doeskins, kerseys, etc., and which are to measure 56 inches when finished, it is well to shrink them to about 54 1/2 inches in fulling, and in turn stretch them before steam-lustring to about 58 1/2 inches. In consequence of the fixing action of the steam-lustring, a part of the stretched width remains, and when then the required finished width of 56 inches is readily obtained. If, on the other hand, the cloth is permitted to shrink exactly to 56 inches, and if the finisher carefully avoids every tension before the steam-lustring as well as after it, or if he stretches it only a little, he will never have the cloth smooth. In conclusion, it should be remarked that cloth sufficiently stretched in drying comes from the later operations, such as shearing, brushing, etc., in a much more satisfactory condition. The goods can then be manipulated better and run straight upon the machines, in consequence of which they admit of a more uniform and better treatment.

The United States' imports of wool for 1905 amounted to 246 million pounds, of which all but 4 million pounds were received at the ports of Boston, New York and Philadelphia.

The number of sheep throughout the world is estimated at 480 millions, of which Australasia has 83, Argentina, 78, Russia, 50, United States, 38, and Great Britain, 30 millions.

CORRESPONDENCE AND NOTES

Upon Textile Topics At Home and Abroad.

THE MANUFACTURE OF HANDKERCHIEFS.

BY ADAM CONVERSE.

The manufacture of handkerchiefs is by no means an unimportant branch of the textile industry. These goods are included among the imports of every civilized country in the world, and in the majority of cases the goods are in the complete finished state. For cotton handkerchiefs Great Britain is by far the principal exporter although Germany is now competing in the coarse, cheap varieties.

Handkerchiefs, like other things, are subjected to the changes of fashion and every year sees new styles placed upon the market. Especially is this so in the case of ladies' handkerchiefs. We have handkerchiefs which in addition to woven novelty, are further ornamented by the mercerizing process, embroidery, calico printing, insertion of lace, drawn thread work and the like. It rarely happens that handkerchief manufacturing is the specialized industry of any one mill. The various styles of finish required would entail a somewhat expensive plant, which, unless the mill were fairly large, would not be fully employed.

The trade is generally carried on by jobbers who place orders for the handkerchiefs in the grey state, forward them to various finishers and finally do the making up and marketing themselves.

Handkerchiefs may be broadly divided into four groups, as below:

1. Plain.
2. Corded, ribbed or crammed borders.
3. Dobby figured borders, including satin stripes, leno stripes, and the like.
4. Jacquard figured borders and centres.

The size of the handkerchief is an important consideration, being varied accordingly as it is required for ladies' or men's use, to suit the requirements of different markets, and also to compete in price.

Ladies' handkerchiefs usually measure from 12 to 15 inches square in the complete finished state. Men's handkerchiefs measure from 18 to 23 inches. Generally the handkerchiefs are square but in some cases they are made slightly longer one way than the other. Ladies' handkerchiefs are usually made three in the width, as the cost of production is cheaper by a few cents per dozen than if made two in the width. Therefore if handkerchiefs measuring 14 by 14 inches were required, the width of the piece would be 42 inches. Of course due allowance must be made for shrinking in the finish and also the amount of cloth taken up for the hem, before deciding upon the size of the handkerchief in the loom.

In the case of group No. 1, few remarks are necessary; all that is required is to obtain cloth of the necessary width and quality. For men's handkerchiefs, apart from the "bandana" type, the only ornament is usually a broad hem (hemstitched). In some cases printing in the form of spots is employed and also embroidery in the form of an initial letter. In addition to the foregoing, ladies' handkerchiefs are further ornamented by the addition of lace, etc., as mentioned above.

The application of the mercerizing process to cotton fabrics has given a great impetus to certain styles of handkerchiefs. Within the last few years, a handkerchief of peculiar liar texture has been placed upon the market under various fancy trade names. The cloth contains about 120 to 130 threads per inch in the warp of 60s and 70 to 80 picks per inch of 100s to 120s weft. It is mercerized, has a delightfully soft feel and, owing to the predominance of the warp over the weft, takes a high lustre.

Probably the greatest bulk of handker-

chiefs made are those on the lines indicated in Group 2. They are ornamented by means of a border consisting of plain cords or ribs, and also crammed or "taped" stripes set to various designs. The cord is sometimes made by using thick material in which case a box loom is required or else the borders must be put in by hand. In the majority of cases, however, the cord is made by putting several ends or picks in the same shed and of the same counts as the rest of the fabric. To effect this special shedding mechanism must be employed and there are two distinct kinds in operation.

In one type an ordinary plain loom is used with toppets to operate the healds. It is obvious, however, that if the shed is to be kept open for several picks in succession the toppets must be driven in a special manner. The toppets are not fast to the shaft in the ordinary way but ride loose and are caused to revolve by the engaging of a clutch box. The clutch box is controlled by a pegged lattice When the clutch is in gear the toppets revolve and plain cloth is woven. A peg in the lattice disengages the clutch and the toppets remain stationary and the shed open for two or more picks. There are three holes in the lattice. One controls the clutch; another controls the take-up catch so as to make solid cords or cram; the third stops the lattice barrel at the end of the border. The barrel is started again at the required time by a measuring device worked from the emery take-up roller.

Looms of the above description, however, are not absolutely necessary for the manufacture of handkerchiefs. A loom mounted with a double-lift dobby may be easily adapted, and manufacturers with existing machinery would prefer this means to the other. Most double-lift dobbies of the "draw knife" type are arranged so that one lag in the pattern lattice controls two picks, there being two rows of peg holes in the lag. It follows therefore that, if the catch which operates the lattice barrel, is lifted out of action, the barrel will remain stationary, and if the lag which is then in operation is pegged plain, the loom will weave plain cloth. This is exactly what is required when the centre and margins round the borders is being woven. When it is required to put a border in the catch is dropped and the barrel moves round bringing the lattices into operation which are pegged to give the required lift to the healds for the cross border portion.

The mechanism is illustrated at Fig. 1. A is a change wheel fixed on the end of the emery take-up roller and varies according to the size of handkerchief required. It gears into wheel, B, which makes one complete revolution for each handkerchief. This wheel carries sharp-pointed studs, c c′, the distance between which can be varied by means of the slots. The distance between determines the space between the borders. As the wheel revolves, the studs come in contact with a similar stud on a rocking lever, D, fulcrumed at E, causing it to be depressed at

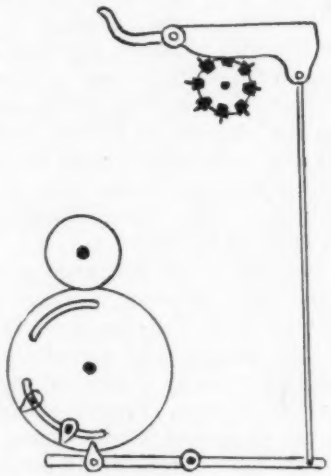


FIG. 1.

this end and raised at the other. The lever, D, carries a strong wire, F, which operates one of the indicator levers, G, in the dobby. This, when F rises up to it, has the same effect upon G as a peg in the latticed barrel. G controls a jack in the dobby. A cord attached to this jack passes over a pulley. It is then attached to the catch of the lattice barrel, If the jack remains down the catch will be held up and the barrel stopped. The peg holes for governing G are left empty on the plain lag which is used when weaving the margins and centre. When F rises, however, it will act like a peg, the jack will be lifted, the catch dropped and the barrel will com-

mence to turn. The border lattices are pegged to keep the jack up, the barrel revolving until the border is woven and the plain lag is again reached.

The mechanism is inexpensive and easily removed when not required. Being mounted

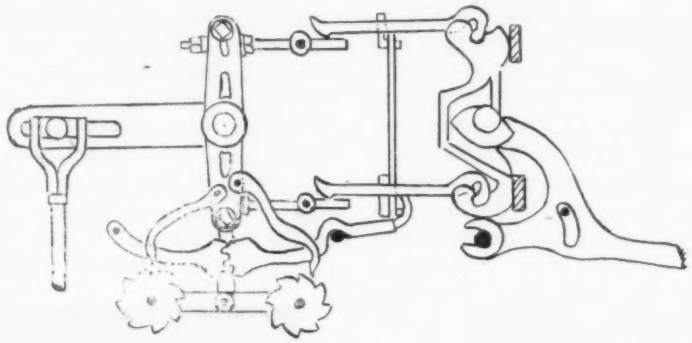


FIG. 2.

with a dobby, the scope of the loom is increased when not required for handkerchief weaving, and on the whole this method is preferable to the other.

Handkerchiefs with dobby figured borders or centres, as in group 3, requiring more than two picks to the repeat, cannot be made by either of the previous methods. As it would be impracticable to use a lag for every separate pick in the handkerchief a special cross border dobby is required. There are several types, one of which is illustrated in Figs. 2 and 3. Two sets of pattern lags are used, one set being for the body of the cloth and the other for the cross border. Each set has its own barrel. When the required number of repeats of the body portion have been woven the barrel is moved out of contact with the indicator levers and the barrel carrying the cross border lattices is brought into operation. The indicator levers A A′, are in two sections, geared together so that either barrel, B or C, can operate the draw hooks, D D′. The barrels are turned by pawls, E E′, attached to the rocking lever, F, which operates the draw knives. Pins which project from the framework of the dobby (not shown in illustration) prevent the pawls from keeping in gear with the barrel when it has been moved out of operation.

The mechanism for bringing the barrels in and out of gear is at the other side of the dobby and is shown at Fig. 3. Lever H, is attached to the rocking lever which carries the barrels, B C. A stud, in H, carries a double nooked link, K. Stud, M, on lever, F, engages with the hooked portion and moves H one way or the other according to which end of the hook has been operated on by M. This is determined by lever, N, which is moved up or down by means of a pegged lattice carried by barrel, P. These lags determine the number of repeats of either pat-

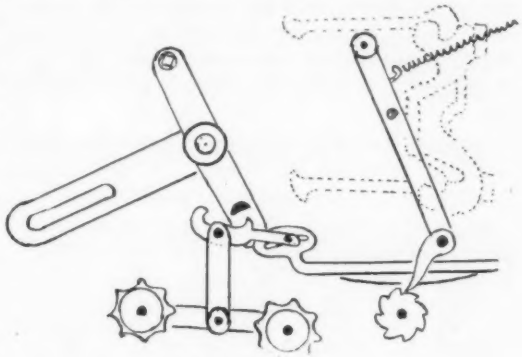


FIG. 3.

tern which shall be placed in the cloth. In Fig. 3, the barrel, B, is in action but a blank has been presented by barrel, P, therefore as F moves forward M will engage with hook, K, and swing barrel, C, into action. It will keep in this position so long as blanks are presented, but a peg will raise lever, N, and lift the other end of K which will become caught by M and bring B into action. A succession of pegs will retain the barrel in this position.

When in action the barrels are kept in position by means of a notched stud and spring.

The required number of repeats of either weave is determined as follows: In the last lag of the lattices carried by B and C a hole is pegged. This peg operates in the usual manner the back "beam" or "bell" lever, S. When S moves it comes in contact with stud, W, on the back of the lever, T, moving it forward and by means of the pawl turns P one tooth. If ten repeats of lattices, B, are required and one repeat of C, there would be eleven lags carried by P. Ten of these would contain a peg and the eleventh would be blank. Almost every kind of dobby handkerchief can be woven on this machine and being perfectly automatic in the changing it prevents frequent stoppage of the loom.

Taken all round, it has much to recommend it as it can always be used for ordinary dobby work when not required for weaving handkerchiefs.

Handkerchiefs with jacquard figured borders and centres are generally made on an ordinary jacquard machine, a separate card being used for each pick, although in some instances special cross border machines are used. In other cases the cards reverse at the end of each repeat for the requred number of repeats, but in such cases the style of design is limited to a perfectly symmetrical character.

Apart from the bleaching, etc., the final finishing of the handkerchief, i. e., hemming, boxing, etc., is an operation which could be well carried out at the mill. The finished pieces are passed through a machine with revolving circular cutting blades, which divide the piece into two or three strips as the case may be. Sometimes they are cut by hand. The strips are then cut up into separate handkerchiefs and are passed to the hemmers. The sewing machines are generally driven by power and are fitted with hemming guides, etc. After leaving the hemmer the handkerchiefs are ironed out, folded, and made up into dozens and boxed, and are then ready for the market. The superintendent of this department should have a good knowledge of the leading styles and qualities and be possessed of a fair amount of originality in the production of novelties, as the final making-up process is very important and much can be done to make the goods attractive looking, thereby insuring a ready sale.

CHECK WEAVE CALCULATIONS.

BY HENRY LYON.

In the preparation of this article the writer has in mind to present one or two simple methods of finding the proper distribution of stop pegs, also finding the average picks per inch, and which are intended for weave room rather than for designing room employes. The check weaves to be used are those in which the taking-up mechanism has an intermittent motion such as sateen, dimity, extra filling, and various other check weaves. This

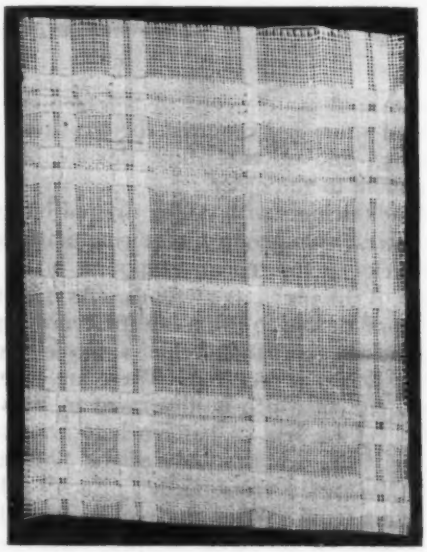


FIG. I.

intermittent motion is generally regulated by means of what are called stop pegs, which are placed in the dobby chain, and by suitable connections are made to check the forward motion of the ratchet gear of the take-up motion. The proper distribution of these stop pegs is generally a vexatious problem and especially so if no detailed record is kept of the number of stop pegs used in weaving the sample pieces.

We will first take for consideration a method of finding the proper distribution of

stop pegs, taking Fig. 1 for an example. A warp is sent to the weave room with instructions to weave it with a gear to give 46 picks per inch, the average to be 73, and the pattern chain to contain 68 bars or 136 picks. In the following calculations all the figures are for a take-up motion operated from the bottom shaft of the loom. As the top shaft revolves twice while the bottom shaft revolves once the take-up will be once every two picks, therefore one tooth on the ratchet gear represents two picks.

Divide the picks per pattern by the lay of the pattern in inches:

$136 \div 73 = 1.863$

Multiply the length of the pattern in inches by the picks per inch, providing no stop pegs were used;

$1.863 \times 46 = 85.698$ Ans.

There being 85.698 picks in 1.863 inches (the length of one pattern) providing no stop pegs are used, it will readily be seen that all picks over 85.698 must be stopped. Therefore, 136—85.698=50.302, which equals the number of picks stopped in one pattern.

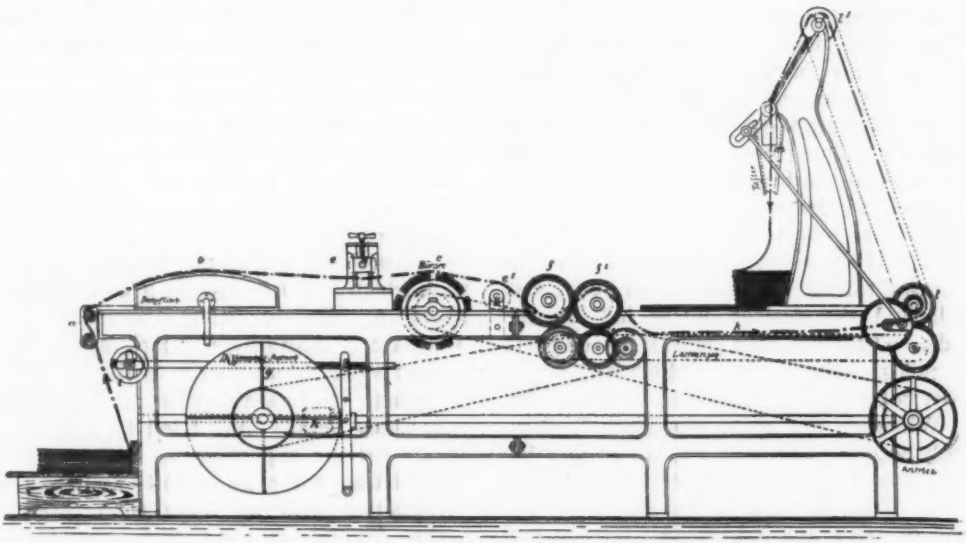
As there are five stripes of an equal number of picks in the pattern, we have (50.30÷5) 10.06 picks per stripe; 10.06÷2=5 stop pegs for each stripe.

The following method of finding the average pick shows that the method above is correct:

Picks	Teeth	Teeth Stopped
86	43	
50		25
136	43	25

If 43 teeth give 136 picks what will 23 teeth give?

$(136 \times 23) \div 43 = 72.74$, or practically 73 average picks.



A STEAM BRUSH FOR WOOLENS.

A STEAM BRUSH FOR WOOLEN GOODS.

The finish of various kinds of woolen goods requires a steam brush after the last pressing in order to remove the surplus lustre and give the goods the right handle. This process is also necessary to prepare woolen goods for manufacturing into garments and also to prevent them becoming marked by drops of water that may fall on them. Steam brushing requires much experience and skill on the part of the workman, as careless handling results in many imperfections. The goods often run into the machine in wrinkles, causing streaks, which are particularly noticeable in light weight goods. Another serious difficulty is the longitudinal tension on the cloth, which stretches the

goods lengthways and decreases the width. This last named defect often results in many claims on the part of the buyer.

The accompanying illustration shows a new machine recently brought out by Theo. Saur, Bielitz, Silesia, Austria, which is stated to be automatic and to do excellent work, independently of the skill and experience of the attendant. Any desired lustre can be left on the goods without the danger of shrinkage in width. The machine can also be used for steaming cloth either before or during shearing, in order to loosen the nap and prepare it for the shearing process.

The cloth passes through the tension device, a, over the steam box, b, and brush, c, in order to loosen and lift up the fibres on the face of the goods. The pressure of the brush is regulated by the rolls, e e'. From the brush the cloth passes to the draft rolls, f f', which are driven by differential drive, g, the speed of which is regulated by the adjustment of the cone, h. The cloth can thus be drawn rapidly or slowly over the steam brush and the desired lustre left on the goods. The draft rolls deliver the cloth to the endless apron, k, from which it is drawn by the rolls, l l', and delivered to the folder, m. While on the apron the cloth is thoroughly cooled. The rolls, f f', are so adjusted that no pressure is brought upon the hot goods. The handling of the goods on the apron prevents any longitudinal tension and consequently any shrinkage in width.—Wollen und Leinen Industrie.

SILK WEIGHTING.

A French patent has been taken out for a process for weighting any kind of silk, whether in the yarn or in the piece, and of any color. Each series of operations begins with a bath of stannic chloride, and is continued with baths of water-glass and of heavy metallic phosphates in various succession. These series are repeated as often as may be desired, beginning with the tin bath in each case. The object of this patent is to economize the tin bath, which is much the most expensive, and to do most of the weighting with water-glass and zinc, aluminium or magnesium. In this process the silk passes from the tin bath through a number of alternating baths of water-glass and heavy metal. It is claimed that each of these increases the affinity of the metal for the next, the absorption of, say, water-glass from one bath increasing the absorption of zinc salt in the next, and so on. The chemistry of the process is analogous to that of the pyroligneate of iron and chestnut extract method for dyeing and weighting silk at the same time.

It is said that this method allows a weighting of from 80 to 100 per cent. with a single tin bath before degumming. By the present methods a single tin bath, even with all the others that follow it, will hardly do more than make up for the loss in degumming, and to get a weighting of 80 to 100 per cent., three, four, and often five tin baths, with their successors, are wanted. The silk undergoes much greater increase in volume by this process than by those at present in use, on account of the large quantity of silicic acid, which is of low specific gravity, which it takes up. The weighting is fixed by means of a bath of dilute hydrochloric acid.

Ever since the discovery of the use of tin-phosphate and water-glass for weighting silk, many people have tried to find a substitute for the expensive tin baths. At the present time a charge of 80 to 100 per cent. is obtained with no more than three tin baths. Experience has shown, however, that a large amount of substitute in proportion to the tin present in the silk is objectionable in many ways, whether the substitute is alumina, lead, zinc, magnesia, or cadmium. If, however, the patentee has really succeeded in doing what he claims, which appears doubtful, the discovery is one of enormous importance to the silk industry. The chemistry of his process is probably not so simple as he thinks.—Zeitschrift fuer Textil und Farben Chemie.

A public order against the exportation of wool to the British Colonies of America was proclaimed in 1699. It was deemed not desirable to supply them with wool, as they might be induced to set up manufactures in competition with the mills of England.

ENGLISH NOTES.

(By Our Special Correspondent.)

The extent of the demand for plain stuffs is the surprise of the summer season in dress goods. Fashion turns up its nose at ladies' tweeds and in the popular market there is a run on brown and navy blue Amazon goods. There is liberal assurance of large business in dyed cloths of the French type made from fine carded and dry combed yarn. Bradford houses buy these goods by the hundred pieces, but local makers have not succeeded in producing anything sightly at a lower cost than 40 cents. Under their tariff Americans have cause to persevere in the making, dyeing and finishing of articles that are always in season and always liable to be very emphatically so.

* * *

In Lincolnshire, the county with the largest wool production, the clip is in excellent condition and the yield is well up to the average. Farmer's prices for wether wool are 32s per tod (28 cents per lb.) and for Lincoln hoggs 35s per tod (30 cents per lb.); or more than in any year since 1880. Holders are hoping, however, to realize 34 cents for the bulk of their hogget fleeces.

* * *

From Massachusetts comes a report of contrasted pictures to be circulated in English mill towns with a view to induce immigration. In one picture is the American mill girl leaving work in dress that a duchess might envy and in the other a slatternly English lass in shawl and smock and clogs. Really such a picture is misleading. Both the American man and the American girl pay more attention to the appearance they present when going to and from work than do normal English people. The time to see our weavers is not when their hair is in curl papers and they are hurrying home. Look at our mill girls on Whit Sunday! See them on Saturday nights and you know at once that they have fine clothes—if not fine manners—for use when they choose to assume them.

The progress of the British Cotton Growing movement may be summarized thus:

Grown in 1903.....	1,900 bales	worth	$145,000
Grown in 1904.....	6,000 bales	worth	400,000
Grown in 1905.....	14,200 bales	worth	950,000
Estimate for 1906...	20,000 bales	worth	1,650,000

The large sum of $50,750 was absorbed last year in salaries and administrative expenses.

* * *

Some light has been thrown on the origin of vegetable fibre in Australian wools. Displainly has come off the rolls of a scouring covery has been made of a lump of hemp that machine. If it is in any way usual to press scoured wool through rollers with jute or hempen coverings there may well be an alarming prevalence of bits that reject the dye and lead to an excessive cost in burling pieces. The Sydney Wool Buyers' Association has taken the matter up and the president proposes to import roller lappings and to supply them to wool scourers at prime cost. In Australia affairs will be put straight promptly, but who is to look after the ways of other ignorant scourers of wool?

* * *

The manufacture of roller-lappings or blankets in England is carried on chiefly by a few Lancashire mills. They produce blankets for paper makers, for newspaper printing presses, and for calico printers in a variety of widths and weights. If their trade does not grow much, it remains a reasonably profitable one for firms with a reputation for sound goods. The industrial employment of textiles frequently escapes attention. My own horizon was widened a little the other day when a friend came to ask what would be a suitable form of felt to use upon an artificial stone making machine. A square of felt is employed under a perforated iron plate to absorb some of the surplus water squeezed from the mixture of gravel and cement when the hydraulic ram ascends.

* * *

We find now at the drapers "phantom" checks and stripes and effects of all kinds. The word "phantom" seems to have come newly into the trade vocabulary and it does express very well those effects which vanish and reappear according to the angle at which goods are held to the light. The value of an

apt name for patterns whose reputation grows by virtue of verbal description, is an item that manufacturers do well not to underestimate.

* * *

The presence of cops in sewers in the English factory districts, which was mentioned in the April issue of this journal, is probably rarer than discoveries of soft material. Even fine and costly silk waste has found its way into the drains by way of the latrines. Somewhat difficult to supervise as these departments are, the management can at least make this destruction of material easily avoidable.

* * *

A great day for Ireland was the opening of the Greenvale Woolen Mills, lately, at Kilkenny. These are expected to employ three hundred people and they have gained the confidence of six hundred shareholders to the extent of $75,000. An occurrence that would attract little notice otherwise derives a new significance from the fact that the enterprise is Irish.

* * *

Accepting the best of the bare evidence obtainable, it would seem that there is one pound of shoddy used in this country to every four pounds of wool. The average consumption of shoddy during the first half of this decade is estimated at 145 million pounds and statistical returns form the basis for the statement that we have been retaining for partial, or entire, manufacture some 630 million pounds of raw wools and mohair. This is equivalent to 19 per cent. and 81 per cent. respectively of shoddy and raw wool. We import, latterly, some 40,000 tons of woolen rags, of a rough average value of $90 per ton, and we suppose ourselves to work up a similar quantity of domestic production. In addition, we buy abroad some 1,800 tons or so of rags.

* * *

Some mild consternation in the Dewsbury district—whither all woolen rags find their way—has been caused by the proposal of the Committee of Taxation of the German Reichstag to put an export tax on rags leaving Germany. The amount suggested is approximately 55 cents per 100 lbs. This plan is formulated at the request of German manufacturers of writing paper who see cotton rags going largely to the United States and woolen rags to England. By restricting export these interests hope to buy supplies more cheaply, but as yet their desire has not been sanctioned. It is being said that the tax would defeat its own object by discouraging the collection of rags and it is recounted how in Austria, Italy, Spain and Russia similar taxes have been found futile and either have been, or are to be, dropped. Of linen and cotton rags, chiefly for use in paper making, we are importers from all sources to the extent of 24,000 tons a year of an average value of $50 the ton.

* * *

The large number interested in methods of rainproofing is probably exceeded by those who are concerned to see whether the proofing has been properly done. This is how our rainproofers observe their results before sending the cloth to the customer. The end of the piece is opened at width for a yard or two and is held by one assistant while another pours a pint or two of water into the valley formed. The examiner sends this water swirling all over the opened lap and sees that from list to list and end to end the cloth "turns" water thoroughly. In a well-proofed piece the water should run in beads and pools like quicksilver in the hand leaving no wet marks or smear behind. By lifting the water-jug and dashing the fluid down upon the cloth it should be possible unless the construction is perfectly opaque, to force water through the interstices leaving the cloth dry above and below. The expert eye determines very quickly whether the goods are proof or not and anyone may judge of the success of the effort by noting the freedom with which the water runs as the surface is raised or depressed.

* * *

Except in cottons, Americans will hardly anticipate more business in Japan and the higher tariff due in 1910 will not improbably preclude even that business. Not the tariff only, but the technical knowledge of young Japanese is to be reckoned with. A Japanese whom I have met in this country has spent

seven years in England, France and Germany, during which time he has obtained experience in every single branch of the bleaching, dyeing and textile printing and finishing businesses. Acquiring theory as he went along, his special duty has been to learn to combat the difficulties that occur in practice. By dint of paying premiums, by the influence of the Japanese government and of the large Japanese merchants, he has seen and understood everything that Europe has to show. To what use the knowledge will be put none of the quiet, inquiring little students will tell. Presumably they are to be technical teachers and assuredly they will have something to teach. My acquaintance was denied access to one department of an important English finishing works, whose heads were afraid the student would carry away information about certain embossing rolls. There is little doubt that he knew more of those rolls than they did, because for months he had been learning the arts of engraving and of hardening them. Perhaps that incident will point to the thoroughness of the study that is being applied to Western methods.

The Mexican cotton crop for 1905 amounted to about 100,000 bales.

DRAWING-OFF ROLLS FOR WORSTED COMBS AND GILL BOXES.

A method of mounting the drawing rolls of worsted combs and gill boxes, invented in England, has recently been patented in this country, the object being to provide an improved arrangement for mounting the rollers and for adjusting them nearer to or farther apart from one another at each end, the arrangements being adapted to enable one of the side frames or top frames supporting the bearings for the rollers to be easily and readily removed when required without in any way affecting the adjustment of the parts when they are assembled again. In the case of the Noble combing-machines and gill-boxes the improved arrangements enable the usual leathers or aprons passing round the rollers to be readily removed and renewed.

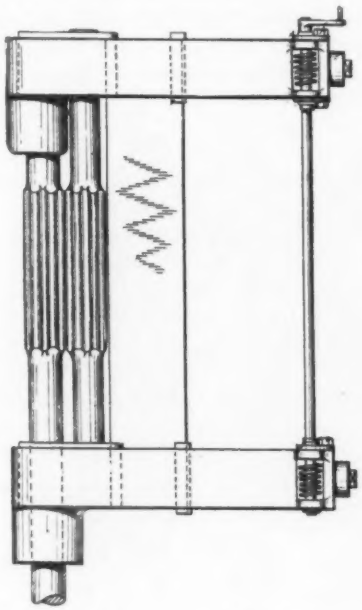


FIG. 1.

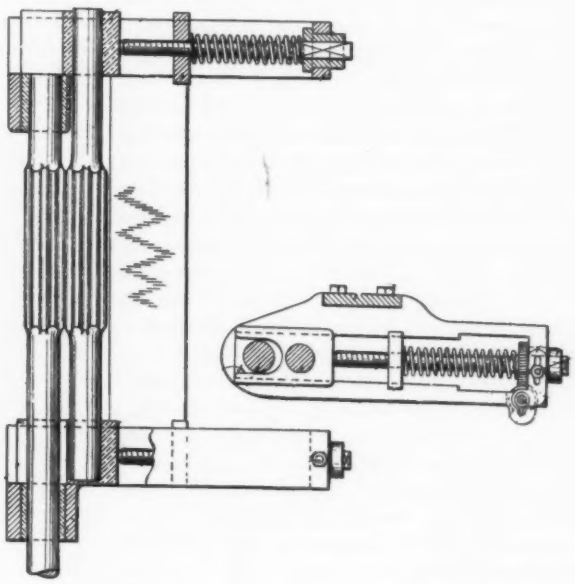


FIG. 2. FIG. 3.

A further feature of the improvements is to prevent undue wear on the leathers and to enable the fibres in the case of gill-boxes and like machines to be drawn in an even manner across the full width of the sliver as the latter leaves the combing-fallers.

As shown at Figs. 1 to 3, bearing-brackets are attached to the combing-machine in the

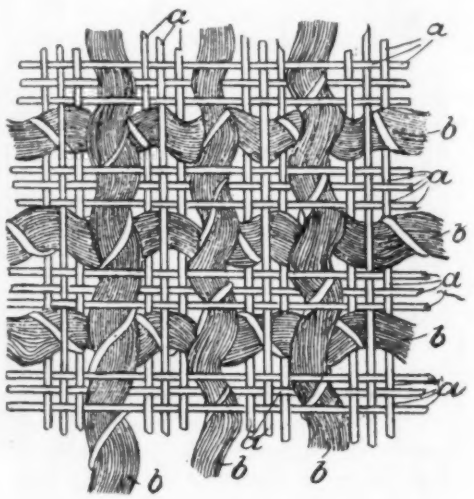
usual way. These brackets are usually made with a fixed bearing in the ends in line with the main body of the brackets. The brasses or bearing-blocks for the movable fluted roller have to be made very thin at that side nearest to the roller in the fixed bearing, and as a consequence the draft of the wool or other fibre in passing through the rollers has a tendency to pull the bearings out of alignment or to wear the holes in them elongated. The flutes or grooves of the rollers instead of remaining parallel to each other, as is required for good work, are pulled to a slight angle with each other and are not as effective as should be the case. They are also out of alignment and tend to cut and destroy the drawing-off leathers, as the pressure upon the latter is unequal.

Under this arrangement it is not possible to give the bearing-blocks sufficient bearing-surface to resist the tendency to wear, as just described. To overcome the defects the first fluted roller is carried in bearings formed on the under side of the brackets. The bearings for the second fluted roller are loose, as shown, and are capable of sliding over the bearings to permit of the flutes of the rollers being brought quite close together, if required. The lower bearings are provided with extension-pieces, forming a fork which passes round the roller, the bearings being kept in position vertically by flanges, which rest on the brackets. The extension-pieces entirely prevent the rollers getting out of line, as they form extended and enlarged bearing-surfaces.

Means are provided for adjusting the rollers to and from each other as required, the said adjusting means being provided, essentially, with a shaft for adjusting purposes which can be readily disconnected or connected to allow the top bracket being removed easily and to enable the drawing-off leathers to be easily changed. The adjusting arrangement consists of screwed rods, which bear against the back of the bearings and pass through nuts. At the outer ends the rods, instead of being passed through circular holes formed in the end brackets, are made square and passed through a flanged bush, which is turned on its exterior to fit a hole formed in the end of each bracket. The squared ends of each rod extend a little beyond the outer ends of the bushes in order to allow the screws to be turned for adjusting the springs. The bushes can then be locked in position but the rods are free to move longitudinally in accordance with the thickness of the wool passing between the rollers.

A NEW FABRIC FOR UNDERCLOTHING.

The accompanying illustration shows a woven fabric recently patented in Germany by Dr. Fritz Lots, Friedrichsroda, and Ludwig Simons, Neuminster, Germany, and intended for underclothing. The inventors claim it will absorb moisture easily and is



superior to knit goods. The coarse thread consists of a heavy roving, twisted with a fine cotton or linen thread, and is introduced between groups, a, of three ground threads, the latter being fine cotton or linen. The coarse thread projects from the fabric and makes the cloth rough without, however, scratching the skin. One advantage claimed for it is that, unlike knit goods, the porosity of the fabric is preserved regardless of the direction in which it is stretched. A coarse wool roving is used for the heavy twist. In weaving the coarse twist is delivered under light tension so as to make the threads project from the fabric.

SIZING WARPS.

BY THOMAS BARR.

The proper handling of warps that are to be heavily sized requires the most careful attention in order that they may reach the weave room in a condition that will give a large production of the best quality. In order to understand dressing warps one should have worked over a great variety of goods and studied each process carefully. There are four points in sizing warps that are of the utmost importance and a number of others that are their close relations. The first and perhaps the most important is the size. Here we must begin right or it will be useless to try to correct the mistakes later on. It is very poor policy to experiment with every new preparation on a large scale; it is better to get the right kind and stick to it.

To make a good, heavy size take

90 lbs. potato starch,
7 lbs. of dressine,
5 lbs. of good tallow,
100 gals. water.

Boil hard until it is well cooked, which should take from one hour and a half to two hours and a half, but to be sure that it is done it must be tested by rubbing some of it between the thumb and finger. If it feels like good engine cylinder oil and does not stick as it cools, it is all right. If it is the least bit sticky it must boil more. After it is done it must be kept hot until it is all used up.

The second point is the section or warper beams. There should never be more than 350 ends of 30s yarn on a 48-inch beam. If the yarn is 45s, fifty ends might be added, but there should never be more than that number. It is understood that the yarns from each beam, called sheets, are separated from each other in front of the slasher by rods, but if the ends on a separate beam are so close that they touch as they pass under the size roll, the ends will become matted together and there is nothing to separate them but the pins. This cannot be done properly and as a consequence they pass on to the warp beam in strings of two or three ends each. On 40s or 45s yarn tapes should be put in every other beam. These should be put in after the last cut mark has passed on to the cylinder so that after the full beam has been taken off the rods can be put in anew, and thus avoid disturbing the lay of the warp threads throughout the length of the beam.

The friction weights should be just heavy enough to keep the yarn straight and taut, so that as the yarn strikes the immersion roll each end is in its proper place. As the yarn goes through the size box, don't think you must drown it; be sure the yarn strikes the immersion roll before it does the size, and keep the size boiling in the box all the time.

The third point is the squeeze rolls. These must be well blanketed, not only as to quantity, but as to quality. The first roll should have about six yards of coarse cotton and wool blanket, and over this about one and a half yards of cotton cloth. This will preserve the life of the blanket and still give good results. The finishing squeeze roll should have from six to nine yards of blanket—three blankets of three yards each. Great care should be taken in putting these blankets on the roll; if the iron roll is not perfectly smooth, if it is the least scaly, it should be sent to the shop and turned down.

Beginning with the iron roll, put on a heavy coat of thick white lead paint, then a yard and a half of cotton sheeting, painting over the first layer. After this has set hard put on three yards of the coarse blanket, allowing the cotton cloth to lap over at least one turn. This blanket should have been well soaked in water. Follow the coarse blanket with two fine all wool blankets of the same length and the same process as the coarse one, both as to the overlapping and the soaking. When the outer fine blanket wears away, strip off the inner one and put the new one next the coarse blanket, and the old one on the outside. Never allow a new blanket to come in contact with the yarn on the finishing roll.

The fourth point is the drying of the yarn. This must be bone dry as it leaves the cylinder. Slasher men working by the day very seldom exceed the proper speed, but in many mills the slasher men work by the piece and then the overseer will do well to keep one eye on the speed of the machine.

There are many other points, a few of

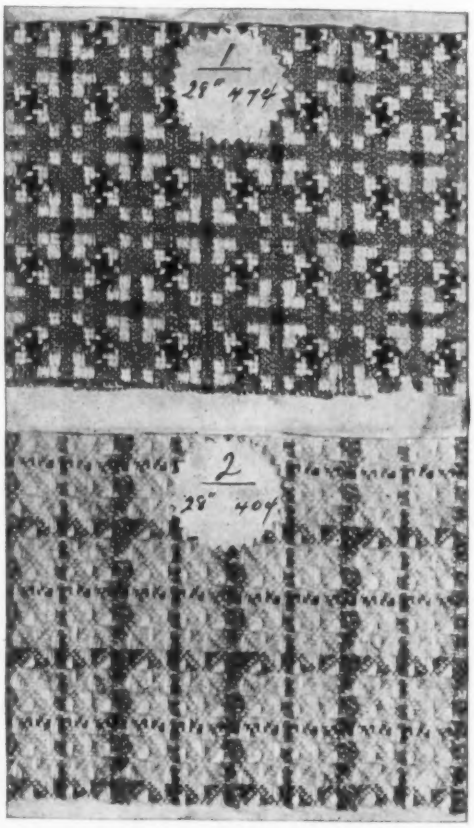
which may be mentioned. The beamers should be trained to piece up every end; they should never be allowed to pick up an end even if only one turn around the beam, but should pull the chain back and tie on a bobbin. This is the only sure way to have perfect work. When the warp beams go from the slasher they should never be piled on top of each other, but should be hung or stood on racks and be kept in a perfectly dry place. In dressing very fine yarn it is well to put in an opening rod in the warp when it is hung in the loom. This is done by the slasher man inserting a tape between the sheets, which are held open by the large dividing rod. A lease rod is run through the opening thus made and the rod is carried up to the back of the rattle. A tape is then put on another rod and passed through in front of the rattle, the rods are withdrawn and the tape is left to run once around the yarn beam before combing the warp. The loom fixer can insert the rod and take out the tape. This rod should be the nearest to the beam when in the loom and is not to take the place of the regular lease rods.

SOME INTERESTING FABRICS.

(Specially Written for the Textile World Record.)

In my time I have seen some remarkable products of the loom, but it is indeed a very long time since I had the privilege of examining such a fine display of cotton products as I did this week. Being down in Leeds and in the mill of a large and important firm of wholesale clothing manufacturers, I naturally asked what were their prospects, and what they had special to show. The principal products of this firm are shirtings and flannel suitings, including men's clothing. Last season they did a good trade in vestings, and already this year they have laid themselves out for a largely increased turnover. During the last six months vestings have become very fashionable, a very large number of young men of the "swell" order having taken to wearing a fancy vest. All the patterns are somewhat loud, and both for business and every day wear they certainly look very well when worn in conjunction with the average tweed suit.

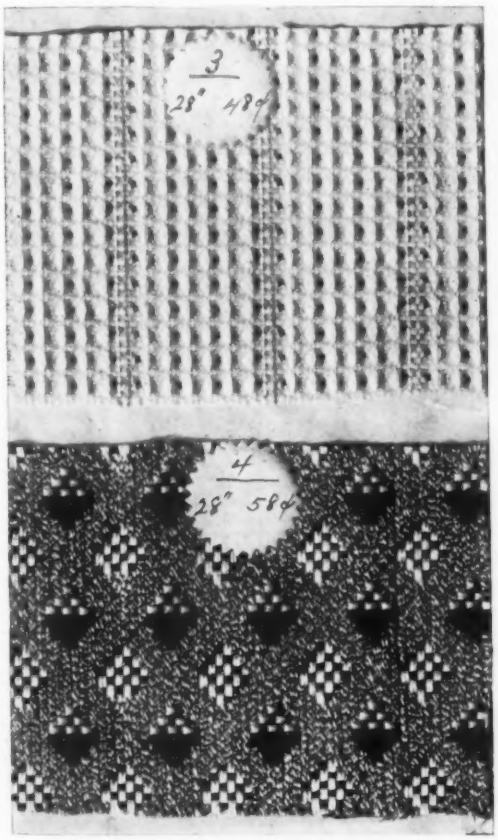
The whole and sole object of these vestings is to create an effect, and the more showy the pattern consistent with beauty of design, the better they are liked. The wholesale clothier said that everything rested in the appearance of the thing, and when one carefully analyzes the fabrics in vogue, there is proof that the cloths comprising the vests are poor, but eminently rich and attractive in



appearance. As far as one can judge there are signs that vestings are going to be largely in vogue. The variety is enormous to choose from, but having the privilege of choosing, I selected four patterns which are making their appearance for the first time this season.

These vests are not made like the ordinary waistcoats, and no buttons are sewed on. One of these vests presents exactly the same appearance as an ordinary waistcoat. Nearly all are washable and it will be seen

how important it is that the housewife be not troubled with having to remove and sew on the buttons every time the vest wants washing. To obviate this every vest is furnished with burnished brass or steel buttons. Now the edge of the waistcoat is turned inside to the extent of about two inches. The brass button is put through and fastened with a



little swivel at the back, like the buttons on the "brats" worn by woolmen in the wool warehouses. This peg-like pin is easily pushed through the eyes of the brass button and quite as easily removed, thus entirely removing any objectionable part for washing. The advantages of being able to put a vest through the wash tub and have it look like new again need not we emphasized here.

The first thing that strikes the casual onlooker is that the patterns have the appearance of silk, while in reality every thread composing the fabric is cotton, but they have all been mercerized. These goods are not difficult to make, and if a manufacturer has good looms he can easily produce the fabrics. Pre-eminently the whole thing is to combine different weaves, and then to brighten up the whole by the introduction of a few colored threads to create the diamond or spots, which are so frequently seen.

Fig. 1 affords an excellent illustration of this effect. Only black and white cotton twist, plain black, white, and green cotton threads are used. The price is under 48 cents per yard. They can be produced at about 36 cents per yard at the mill.

Fig. 2 is also good. We see here that large and small squares have been formed in quite an easy way. There is nothing peculiar about the pattern. The effect is obtained by the introduction of twist and colored threads. About 34 cents is the manufacturer's price.

Fig 3 is a delicate combination, the way the light brown, white twist and green cotton combine to make a very attractive design. The warp is solid white with the exception of the twist that makes the stripe effect every three-quarters of an inch. The effect is all got in the loom, and is very easy to make. The manufacturer's price is about 48 cents.

The last pattern, Fig. 4, is more of a "bread-and-butter" order and is entirely composed of black and white twist, and plain black and white yarns. This is produced in the first instance at about 50 cents.

Without doubt there is a good future before this style of vest. Our wholesale clothiers are turning out vests all complete for the wearer's back as low as 72 cents to the retail clothier.

There seems to be still a big rage for tweeds on all hands, Huddersfield manufacturers, and especially up the Colne Valley, being fully as busy as when they were making for the American market during the time of the late Wilson tariff.

In Belgium there are thirty-three schools for the teaching of weaving, and all are subsidized by the Department of Industry and Labor.

EFFECTS OF DOFFER SPEED ON COTTON YARN.

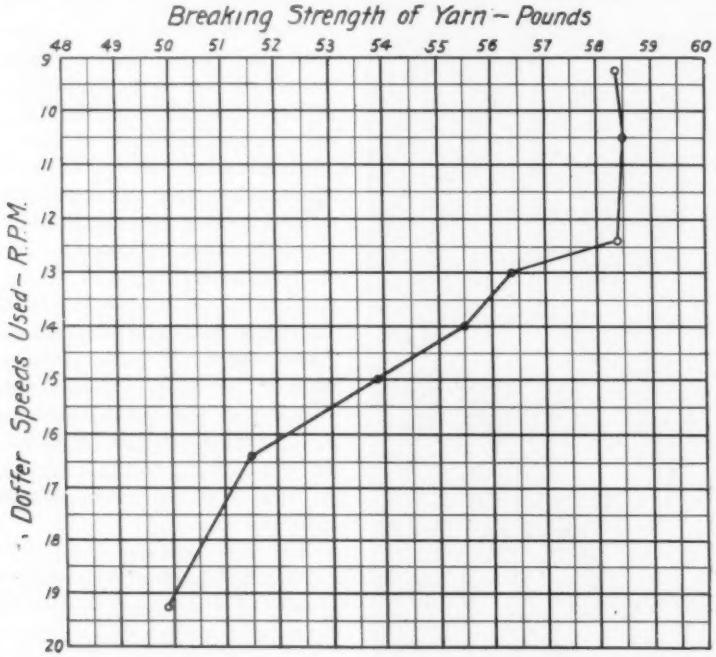
BY B. M. PARKER,
Instructor in Carding and Spinning, Clemson College, S. C.

It was the purpose of these tests to see, if possible, the exact effects of high and low doffer speeds on the breaking strength and quality of cotton yarns spun under conditions in every other respect similar. Care was taken to have all conditions the same as regards temperature and humidity. Mississippi cotton of 1 1/8 inch staple was used, running about a 14-ounce lap on the finisher picker. The cotton cleaned nicely and the laps looked well. The card used was the Saco & Pettee revolving top flat, with a cylinder speed of 165 r. p. m., and a draft of 110, giving a 54-grain sliver. The following doffer speeds were used in the different tests: 9.25, 10.5, 12.3, 13, 14, 15, 16.4, and 19.3.

Especial effort was made to note the appearance of the slivers as they were combed from the doffer. Practically there was no difference between the slivers of the first four tests, after this, as the doffer speed increased, the web became cloudy and dirty, this condition increasing as the speed increased, the last web looking very poor.

All the slivers ran equally well on the drawing frame, but from their appearance it was easy to tell those from the higher doffer speeds, as they contained considerably more neps and motes.

On the fly frames the ends that broke were nearly all confined to the slivers from the high doffer speeds. This was very noticeable in the seventh and eighth tests, the number of ends breaking in these two being more than the number in the other six tests.



The fine frame ran 5.4 hank roving which was doubled on the spinning frame and drafted 11 which gave 30s yarn. A twist multiplier of 4.5 was used.

The humidity was looked after and kept at from 65 to 75, the temperature being about 70 throughout all the processes of the different tests. All the yarn on the spinning frame ran fairly well, that from the lower doffer speeds showing few ends down while that from the faster doffer speeds showed the largest number. On this frame the last two tests gave the most trouble in this respect.

The appearance of the yarn was about the

same for the first four tests, after this the yarn showed up rougher and dirtier, the yarn from the last test being very inferior.

In getting the breaking strength of the yarns, 10 bobbins from each test were taken, reeled, weighed and broken. The following table gives the speeds used, the average size, and the breaking strength.

Test.	Doffer Speed.	Counts.	Breaking Strength
No. 1	9.25	29.3	58.4 lbs.
No. 2	10.5	29.	58.5 lbs.
No. 3	12.3	29.4	58.4 lbs.
No. 4	13.	29.3	56.4 lbs.
No. 5	14.	29.5	55.5 lbs.
No. 6	15.	29.	53.7 lbs.
No. 7	16.4	29.2	51.5 lbs.
No. 8	19.3	29.3	49.8 lbs.

Difference in doffer speed 10 r. p. m.
Difference in breaking strength 8.7 lbs.

Beginning with the first test, the yarn from ten bobbins was carefully examined under the microscope to test its smoothness. This was continued until yarn from all the tests was examined. There was no appreciable difference in the first three tests, but beyond this the yarn showed up rougher, dirtier and more uneven, these defects increasing as the doffer speed increased.

By the table we will notice that there was no difference in the breaking strength of the first three tests; beyond this the breaking strength gradually decreased as the higher speeds were run, the lowest being with the highest speed.

To the naked eye there was no difference in the first four tests, but here the yarn began to be fuzzy and dirty, this increasing throughout the rest of the tests. The yarn from the last two was of poor quality.

Then we would conclude that with a card doffer speed of 9 to 13 r. p. m. there is no great difference in the appearance or breaking strength of the resultant yarn, while with higher speeds there is a decided falling off in the breaking strength and the yarn is rougher and more uneven and contains more dirt and nep, these defects increasing as the speed increases.

The line in the accompanying diagram will illustrate the varying breaking strengths due to the different doffer speeds, probably more clearly than the table.

The total value of raw silk produced in Japan is estimated at $25,000,000 annually.

SCOURING WOOL.

A solution for scouring wool, recently patented in this country, by a resident of London, England, is described as follows:

A mucilaginous liquid, such as a decoction of linseed, is mixed with a fat or fatty oil, such as castor-oil and with saponin, which may be added either as such or by digesting the decoction with the addition of soda, preferably carbonate of soda, with a material containing saponin, such as horse-chestnuts, acacias, or rita-nuts. To the mixture thus made is added some hydrogen peroxid or materials which produce it, such as a vegetable acid or acid salt, and a suitable peroxid. For example, two and one-half pounds of linseed or three-fourths of a pound of other vegetable material yielding mucilage are boiled with five gallons of water and the decoction is strained and there is added an extract made by digesting twelve and one-half pounds of stripped horse-chestnuts with five gallons of water to which carbonate of soda has been added, or the linseed and horse-chestnuts may be digested together and the decoction strained. About one-half pound of a fatty oil, preferably castor-oil, is now added, followed by about one ounce of a feeble acid, such as acetic acid or an acid salt, like salts of lemon, and about one and one-fourth ounces of some suitable peroxid (preferably in solution), such as sodium peroxid. This liquid is now ready for use as a detergent for scouring wool or the like.

The above recipe is suitable for fine wools. Coarser varieties need more saponin than is obtainable from horse-chestnuts. For these, therefore, there may be added to the above mixture saponin from any source—say on the same scale of proportions, ten pounds.

The essential ingredients of the detergent are the mucilaginous vegetable matter and the saponin. A vegetable acid is advantageous and the peroxid is useful in yielding hydrogen peroxid, which may of course be substituted for it.

By use of this detergent the wool grease is removed from the wool without being saponified and is therefore easily recovered. The wool is at the same time made more flexible than in the ordinary scouring processes and requires less oil in spinning. Moreover, the yolk remains in the wool, which is therefore of better weight.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Numbering Silk.

Editor Textile World Record:

How is tram silk numbered? I have received instruction in school to the effect that it is numbered on the basis of 20,000 yards per ounce, but am unable to find any confirmation of this among manufacturers. Merrimac (674).

Tram silk is numbered by the dram system, the number indicating the weight of 1000 yards in drams. This is equivalent to the weight of 16,000 yards in ounces, or of 256,000 yards in pounds. There is no system of numbering tram silk based on 20,000 yards per ounce. Merrimac has been misinformed in this respect. Some manufacturers who throw their own raw silk for weaving, retain the denier system throughout for the sake of uniformity. All raw silk throughout the world is numbered by the denier system.

Varnish for Lingo Cords.

Editor Textile World Record:

Please give me the recipe for the varnish for the lingo cords mentioned in the Question and Answer Department in your May issue.
Mitchell (672).

When it is required to have the lingoes quite stiff they should be varnished with a mixture made of two gallons of boiled linseed oil, one-half pound of japan, one pint of turpentine and one-quarter pound of resin. If they do not need to be very stiff the turpentine is omitted. During an experience of over twenty years I have found that the lingoes are more apt to break when treated with this mixture than when linseed oil is used alone. Pure oil makes them more pliable and they will last longer by several years.
Henry Owen.

Twine for Jacquards.

Referring to Butler's question in the May issue regarding twine for jacquards, I would add that in many mills the frames are supported by iron rods attached to the cross beams at the ceiling. As a result the frames vibrate in every direction, shaking the jacquard head so that the lingoes are always tangled and the yarn is continually breaking. This method of connecting the wood supports for the jacquard head should not be used as it breaks the yarn and the lingoes, and the lingoes will not last half the time they otherwise would. The best way is to connect the ends of the arch of the loom to the end of the wood parts, crossing above in the usual manner. The iron rods are also used to connect the wood work to the beams or the roof when the frame is not connected to the loom arch.
Henry Owen.

There would be no objection to using a twine for the regular harness that was twisted a little harder, providing care was used in varnishing and drying. It would be well to varnish the harnesses where they are joined to the neck cord and several inches below, especially if it is a cross-tie harness; also on the harness where it passes through the comber board. It will be necessary to have the harness perfectly dry before using or it will twist.
Will Nelson.

If the harnesses are enclosed properly in the box and separated over four inches there will not be any trouble, provided the pitches of the comb board and the reed are the same. I have found it a good plan to begin with to use soapstone on the twine. J. A. L.

Twisting-In Warps.

Editor Textile World Record:

Is there an economy in the practice of twisting in warps on plain work? Panama (680).

From my experience I should say that there is an economy in twisting-in plain warps. If a loom fixer runs his section and does all the changing without the aid of a helper it is economy not to twist-in, as he can then change a warp in less time than if it is twisted, especially if there are a large number of ends in the warp. When a spare fixer does the changing it is better to have the warps twisted-in for a twister is usually paid by the piece and so the loom will not be idle as long when changing the warp and no spare fixer will be needed. Henry Owen.

I do not think there is any economy in twisting-in warps on plain work unless it is on looms equipped with drop wires, then the cost of wiring up the new warp will be saved by having it twisted in the loom. On looms without wires the warps can be drawn in 20 per cent. cheaper than twisting them in, besides the advantage of a thoroughly clean harness and reed on each drawn warp.
Clinton.

The Numbering of Sewing Cotton.

Editor Textile World Record:

We wish to know something about the number of yards in a skein or cone of 40/3 sewing thread. According to the rule of allowing 840 yards for No. 1 yarn there will be in one pound of 40/3, 11,200 yards. We have always had serious doubts about this number of yards; in estimating we allow not over 9,000 yards. Now we can buy this thread at 45 cents, getting as we estimate 9,000 yards, and we can buy a cone of 12,000 yards at 50 cents, which is cheaper provided our estimate of one pound at 9,000 yards is correct. Let us know if we are wrong and if so how much does an ordinary cone or skein contain in yards per pound.

Knitter (677).

In response to this question we addressed a number of letters of inquiry to prominent thread manufacturers. Among the replies was the following letter from one of the leading thread manufacturers of the United States.

Dear Sirs: Referring to your letter of the 8th inst., we regret to say that we are unable to give you the desired information. Japstock.

Another correspondent wrote as follows:

Dear Sir: A single yarn of such a size that 840 yards will weigh a pound, or 7,000 grains, is called No. 1; therefore No. 10 single would measure 8,400 yards. If the yarn were 2-ply the length would, of course, be but one-half. To determine the size of a yarn, divide the weight of one yard of No. 1 single, which is 8.33 grains, by the weight of one yard of a given sample, making allowance for the ply. Standard brands of cotton sewing thread are sold by the yard and not by the pound, and the numbering depends on the ply or number of strands to the thread, the basis for numbering being 6-ply. As an illustration, a number 60 six-cord cotton sewing thread is made from six strands of No. 120 yarn. To obtain the same size thread in circumference in a three-cord, three strands of No. 60 yarn would be used, and in two-cord, two strands of No. 40 yarn would be used—40 single 2-ply being equal to No. 60 single 3-ply or No. 120 single 6-ply. This formula, however, applies only to standard brands, it being a common practice among a certain class of manufacturers to use a slightly coarser yarn to make their product show the tensile strength of the standard goods in the various qualities and plies. In six-cord sewing thread after the No. 70 is reached the numbering is an arbitrary process, but manufacturers of standard brands follow the same schedule. Ticket size 100 is generally made from 150 yarn. Fergus.

The following letter is from a thread manufacturer of long experience:

Dear Sir: As long as I have been connected with the thread industry, some sixteen years, the numbers of thread as sold on the market have been different from the yarn numbers, and the numbers under which it has been sold have been called the ticket numbers. Sixteen years ago threads were numbered up from the yarn. That is to say that a 30/3 yarn was ticketed and sold as a 36/3; 30/4 yarn was sold as a 36/4. Two or three years later a change was made in the method of marking and four-cord yarns were then ticketed back instead of up, and the 30/4 cord yarn was sold on the market as a 24/4 thread. The idea of this was that there was more uniformity in thread sizes of the same number though of a different cord. These systems of marking thread were practically universal until the forming of the thread combine. Within a short time after the formation of this so-called "trust," the marking of three-cord threads was changed, and the 30/3 cord yarn was sold as the 30/3 thread, and all other numbers the same as the yarn number. This was in effect to raise the prices on their thread without apparently doing so, as the coarser the yarn the more it costs to sell by the yard. At present it is impossible to tell what any concern is selling for thread. The combine is as variable in the sizes it puts out as any of the so-called independent concerus are, if not more so, as in some places straight numbers are used and in others they are marked up. Four-cord sizes are practically unchanged. Six-cord thread has been marked back, a 60/6 cord yarn for 30/6 cord thread; this was to bring it in conformity with three-cord. If this scale was followed all the way up the line it would bring a 200 six-cord yarn for a 100 cotton, but the scale of marking back one-half the yarn count has been apparently departed from when the yarn reaches No. 120. This is usually marked 60/6 cord thread although we quite often find it marked 70/6 cord. Thread from this size list up 130 for No. 80; 140 for No. 90, and 150 six-cord yarn for No. 100. Three-Cord.

We reeled the thread from a spool marked "J. & P. Coats 100 Best Six Cord" and found 84 yards to weigh 28.7 grains. This is equivalent to 20,488 yards per pound, or 6/146s cotton by the 840-yard standard. In testing yarn or thread the cotton number, indicating the 840-yard hanks per pound is readily found by dividing 100 by the weight in grains of 12 yards of the yarn.

Ex.—12 yards sewing cotton weighs 5 grains, find the cotton number.

100÷5=20s, count of yarn.

If this yarn is 6-ply the single strand is 20×6=120s.

The letter following is from one of the most successful manufacturers of spool cotton in the country:

"In reply to your inquiry, will say that in many cases the numbers put on their spools by thread manufacturers do not mean anything. There is only one way to number thread correctly and that is by the system now used for cotton yarn and by which the number indicates the number of 840-yard skeins in one pound. If one pound measures 840 yards the number is 1; if it measures 1680 yards the number is 2; No. 70 yarn would measure 70 times 840 yards."

This manufacturer's idea to use the 840-yard cotton yarn system for thread should be adopted. That system is firmly established for cotton yarn throughout the world. Its use for thread would not involve a change of any established standard because, as is evident from the accompanying letters, there is no standard established for thread. By its adoption for numbering thread both yarn and thread would be brought to one common standard, and the confusion from the use of two standards would be avoided. This desirable object can be easily attained if buyers will insist on having the thread they buy numbered by the 840-yard system with which they are now familiar.

Comparative Yarn Counts.

Editor Textile World Record:

We are making a garment of 2/8s worsted so as to weigh a certain weight, what size or sizes could be used with 2/12s to make the same weight garment, our object being to utilize two or three threads of 2-ply yarn so as to equal a yarn of much lower count? Is there a table published giving this information? Wisconsin (684).

The count resulting from twisting two different counts together is so easily calculated that a table is hardly necessary for the purpose. It is first necessary to reduce all counts to the same basis, cotton, linen, worsted, run, or grain system. Then the calculation depends on whether the count is based on a fixed weight, as in the case of the cotton system, or on a fixed length, as in the case of the grain or denier method of indicating yarn sizes.

In a given length of plain ply yarn there is an equal length of each of the different single strands, aside from the variation due to twisting and which we will disregard. Thus in one yard of 3-ply made of 20s, 30s and 40s cotton there is one yard of each of these strands, 20s, 30s and 40s.

If the size of the yarn is indicated by the fixed length method the resulting size is equal to the sum of the sizes of the single yarns. For example, let us assume that three strands weighing 16, 12 and 20 grains per 120 yards respectively are used to make a 3-ply. The resulting size will be equal to the sum of 16, 12 and 20, which is 48 grains per 120 yards.

To find what fixed length count must be used with the other known counts to give a required resulting count, it is necessary to find out what count added to the others that are known will give the required resulting count. Thus, if we desire to add a third thread to a 16 and a 12-grain thread to make the 3-ply 48 grains, the count of the third thread is found by subtracting the sum of 12 and 16 (28) from 48, which gives 20 grains as the count of the required thread. This method applies to all fixed length counts, whether grain, denier or other system, it being necessary in each case to reduce all counts to the same basis.

For fixed weight counts the calculation is slightly more complicated, but presents no great difficulty, provided the principle is clearly understood. This can be best explained by a few examples.

1. Let us suppose that a 2-ply is made up of 12s and 6s. Find the resulting count. Calculating the weight for any convenient length, say 12 hanks, we have

12 hanks 12s = 1 lb.
12 hanks 6s = 2 lb.

12 hanks 2-ply = 3 lb.

As 12 hanks of the 2-ply weighs 3 lbs., the count of the hanks per pound is 12 ÷ 3 = 4s. Resulting count.

2. If it is desired to know what count must be twisted with a known count, say 12s, to give a 2-ply, say 4s, any convenient length, 12 hanks for example, is taken as a basis and the calculation made as follows:

12 hanks 4s (2-ply) = 3 lb.
12 hanks 12s (known count) = 1 lb.

Difference to be made up by second thread 2 lb.

Twelve hanks of the second thread must weigh 2 lbs., and the count must, consequently, be (12 ÷ 2) 6s.

Another method of making these calculations for 2-ply is as follows:

1. Product of single counts ÷ Sum of single counts = Resulting count.

(12 × 6) ÷ (12 + 6) = 4s.

2. Known count × Resulting count ÷ Known count — Resulting count = Required single count.

(6 × 4) ÷ (6 — 4) = 12s.

For three or more ply the calculation is based on the same general principles, being varied to suit the particular case. Thus:

Ex.—What is the size of a 3-ply made of 60s, 36s and 45s, fixed weight count?

Taking 180 hanks as a convenient basis we have:

180 hanks 60s = 3 lbs.
180 hanks 36s = 5 lbs.
180 hanks 45s = 4 lbs.

180 hanks 3-ply = 12 lbs.

180 (hanks) ÷ 12 (lbs.) = 15s (hanks per lb.), Resulting count.

Ex.—What count must be put with 60s and 36s to make the 3-ply equal to 15s?

Taking 180 hanks as a convenient basis we have:

180 hanks 3-ply (15s) = 12 lbs.
180 hanks 60s = 3 lbs.
180 hanks 36s = 5 lbs. 8 lbs.

180 hanks third strand 4 lbs.

180 (hanks) ÷ 4 (lbs.) = 45s (hanks per lb.), Count of third strand.

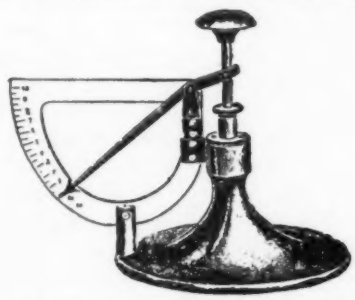
The results of these calculations are the same regardless of the length taken as a basis. Thus 180 in the last two calculations was taken because it is easily divisible by the respective counts.

Thickness of Felts.

Editor Textile World Record:

We are manufacturing felts that the buyer requires to be of a certain thickness. More or less difference of opinion arises in making deliveries because of the difference in measurements made at the mill and by the buyer. The buyer's measurements are nearly always less than ours. We both measure with calipers but it is very difficult to tell when the calipers are adjusted to the actual thickness of the goods. Will you give us a method to measure the thickness of felt that is not subject to such variations and will be fair to both buyer and seller? Hammerstock (683).

It is extremely difficult if not impossible to measure the thickness of felts with calipers. In his recent work, "L'Analyse des Etoffes," Achille Lecointre recommends the use of the instrument



shown in the accompanying illustration. It is placed on the felt to be measured; the upright rod has a needle at the lower end, which is not shown. The pointer moving on the graduated scale at the left is connected with this upright rod and when the point of the needle is even with the bottom of the plate, and, consequently, even with the upper surface of the felt on which the plate rests, the finger points to zero. By pressing the central rod down till the point of the needle strikes the table or other surface on which the felt rests, the pointer is raised and the thickness of the felt is indicated on the graduated scale.

This is evidently a very accurate way to measure the thickness of felts because the plate resting on the felt, and the table on which the felt rests, correspond exactly with the face and back of the felt.

Master Mechanic.

Editor Textile World Record:

In the textile mills in New England is there an employe called a master mechanic, who has charge of the engineer, loom fixers, etc., and responsible for everything except the office and manufacturing end? It seems to me that the responsibility for success or failure and the superintendence of all the employes should be in the hands of the superintendent. Keystone (661).

A master mechanic in a textile mill has general charge of the iron and wood work for repairs to the machinery and building. His duties vary in different mills and therefore cannot be defined in general terms. He has charge of such repairs to the looms as are made in the machine shop; usually most of the loom repair parts are stored in his department. He is not responsible for everything except the office and the manufacturing end, but is usually under the superintendent or agent. In some mills the superintendent is under the agent and has charge only of the details of manufacturing, having nothing to do with the buying of the raw material or the selling of the goods. The owner of the mill organizes his mill to suit himself and assigns to the agent, superintendent, master mechanic and other overseers such duties and responsibilities as he may think are for his interests. The master mechanic bears the same relation to the iron and wood work repairs of a mill that the overseer of carding bears to the carding department.

Single and Double Knot Harness.

Editor Textile World Record:

What is the comparative life of single and double knot harness? Ringgold (679).

I have found very little difference in the length of time a harness will wear, whether single or double knot. Each has its good qualities, but under different conditions. Clinton.

I have found that a single knot harness will last almost as long as a double knot harness, that is, a single knot usually lasts from five to eight years, and a double knot from five to ten years, if they are treated with a good varnish.

Henry Owen.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 236 to 253. Also Buyers' Index.

THE KNIT GOODS SITUATION.

A decided scarcity of light weight underwear for immediate delivery is evident. Retailers throughout the country are complaining on account of not being able to get filling in orders from the jobbers, and the jobbers say, it is impossible to get manufacturers to make quick deliveries, and anything in the way of stock lots, seconds, etc., were almost entirely cleaned up in the month of May. Several buyers of large Western jobbing houses made trips to New York at that time and as one selling concern expressed it, "they cleaned us up good."

Some duplicate business on fall lines has been placed during the past month, but not enough to indicate that any unusual demand is being made on any particular lines. Buyers find that a majority of the manufacturers are not in a position to take early delivery business and practically none of them are anxious for business either for early or late delivery; the only exception being those makers of ladies' carded yarn ribbed goods, and even they are not so anxious as to break the agreed-upon price of $2.00 for 6 pound, $2.20 for 7 pound and $2.40 for 8 pound goods, but rather there is a good indication that these prices will be advanced five cents per dozen in the very near future.

One of the largest of the ribbed goods manufacturers has just returned from Europe and it is reported that the future will see large quantities of this class of goods exported. It is believed that some buyers have been waiting for a break in the prices of ladies' carded ribbed goods and that they must now make known their wants and that instead of the looked for break, they will find themselves obliged to pay the advance. It is certain that raw material conditions warrant it and it only remains for the manufacturers to stand firm to get it.

It was expected that a general opening of 1907 lines would take place the latter part of May, but this did not occur and at this writing, only a very few lines have been opened.

A number of manfacturers of men's low priced balbriggans met in Utica and agreed upon June 5th as a date upon which a general opening should take place. It is understood, however, that J. K. Stewart did not enter into this agreement and his representatives are now in the West, soliciting business at about 8 per cent. to 10 per cent. advance over last season's prices. Why June 5th was settled upon is not entirely clear to the writer, for the cotton situation will not be any more settled then, than in May, but it is probable that this date was agreed upon as one when the manufacturers would have their deliveries in better shape to go before their customers, and that it would also give them plenty of time to get up their line of samples which some of them had been unable to do, owing to having been so busy.

Conditions now warrant the price of $2.00 to $2.05 for five pound balbriggans, but manufacturers hesitate to put on sale lines at these prices, fearing that the buyers will pursue the same waiting policy, as they have done on ladies' fall weight carded goods, so the probabilities are that the popular garment will be made to weigh 4¼ to 4½ pounds and to cost about $1.90 to $1.95.

The lines of men's ribbed goods as far as shown indicate an advance of about 12½ cents to 15 cents per dozen, and it is understood that the Morris Mills have about sold up their production at $1.95 per dozen for the garment sold last season at $1.82½.

The situation on men's combed balbriggans promises to be just as interesting as on the carded goods. In fact, the proportionate advance and still greater scarcity of combed yarns warrants a heavier advance on manufactured goods and it now looks as though there would be an advance of about 37½ cents to 50 cents per dozen on five pound combed Egyptian goods. This will result in

more stained goods being used and also that buyers will be asked to take 4¼ to 4½ pound goods for their standard.

It is reported that considerable business is being done in a quiet way by manufacturers of staple lines at fair advances with guaranteed prices and also by another class of manufacturers who are not getting a fair advance, but of the latter, it is said that they are not even speculating, as they will deliver goods according to raw material conditions which exist at the time of delivery and not according to samples from which sales were made.

One line of spring goods on which orders are being placed very freely is the patented "Porosknit" line made by Chalmers Knitting Co. It is said this mill is very busy this season, supplying these goods and they are now out soliciting business for 1907 at the same prices as this year. These goods are made in a wide range of colors in cotton at $3.50 and in mercerized yarns at $7.00. They are made in the ordinary shapes and also in athletic cuts which are growing in demand.

Erlanger Bros. have been sold up three months ahead during this year on their Nainsook sleeveless coat shaped shirts and knee length drawers to retail at 50 cents.

The Scriven Company have also been very busy on their elastic seam goods, shirts made with short sleeves and sleeveless with elastic seams at the sides of the garments and knee length drawers made in cambric, Jean, madras cloth, nainsook, lawn, mercerized cloth and silk. These garments get to the consumer at from 50 cents to $5.00 each and are rapidly growing in popularity.

J. C. Roulette & Sons are offering their line of cotton and lisle vests, pants, tights and combination suits for 1907 at an advance of about 15 cents per dozen over this season's prices. They have been running their mill 16 hours a day since January 1st in an effort to catch up with their orders, made necessary by the fire in their warehouse in the month of January which destroyed about $50,000 worth of made up goods. They are showing a line of hand trimmed lisle goods, the hand work being done in their branch factory in Williamsport.

HOSIERY.

A large volume of business on fashioned lines for 1907 has already been done and this in the main with buyers who make European trips. Ordinarily they place some few orders before sailing, but this year their purchases were much larger than usual and it is now reported that owing to the high prices and attendant difficulties in placing orders in Chemnitz that a number of them are returning to place still larger orders with domestic manufacturers.

Orders for goods to retail at from 35 cents to 50 cents have been large, and those for 25 cent qualities have reached record breaking proportions. The advance being asked is about 5 per cent. to 7½ per cent. and this is being obtained principally by changing the quality of yarn, reducing the weight and gauge and keeping prices within the proper range.

The projected increase in the production of domestic full fashioned goods is very large, but there is now no question but that it will be well taken care of for some time to come. Machinery men are the authority for the prediction that there will not be much increase of production for at least one year, for the reason that the builders are so far sold ahead and it is impossible to get this class of machinery delivered on short notice.

The business on the seamless lines will not be finished as quickly as on fashioned goods. There are so many more lines to look at that it will take buyers considerably longer to make selections and the probabilities are that a great deal of dickering will be done in the matter of prices and that it will not be possible to obtain the same advance as on the fashion goods.

In regard to styles most active, black laces and embroidered goods with black grounds continue to be the most popular, the embroidered goods leading somewhat. Pearl grey is in good demand at all prices; white continues to be called for largely and green shades are also in demand. Tans are somewhat slow in ladies' goods but are taken freely in men's goods. Fancy striped and plaited half hose are being taken freely.

CHEMNITZ REPORT.

A great many buyers from the large importers have already been in the market. They came this season somewhat earlier than usual not so much to place new orders,

but on account of the delays in the delivery of the orders that were due in December and January. While large shipments leave town every week, manufacturers are not nearly able to keep their promises and it will be July or even August before the last of the old orders are shipped.

Owing to the fact that prices are a good deal higher now, than they were at the time these orders were placed, nothing is canceled, but everybody insists on getting his goods, and each one wants to be the first to get them. With the machines that have been set up and the plants that started during the season, manufacturers would be able to turn out far more goods, if help was not so very scarce. In the mills as well as in the finishing rooms, many places are vacant and wages are higher than they have been for many years, as the working people know very well that they are worth the price at the present time. Wages are often so high that together with the increased cost of raw materials, the cost of an article is today from 15 per cent. to 20 per cent, higher than it was three months ago. Under these circumstances the old qualities cannot be sold at the former price, but still makers find it very difficult to make their customers take the lower values which they brought out to give a stocking at the popular price. In low priced plain staple numbers, not so many orders are placed, but so large a quantity of these goods is needed for embroidered styles that none are in the market, and the mills cannot turn them out fast enough.

In lace hose, the delays are enormous and importers are glad to get part of their purchases so they can keep going. As it looks now there will be very few or none at all for sale for next spring, as nearly all mills have received plenty of orders to keep them going until the end of the year. These orders are not coming from the United States alone, but the home market as well, as all other European and foreign markets have taken the article up. Even if they should not be so popular in the United States, it would not affect the prices very much.

At the present time, the very fine gauge gauze hose seem to have the preference even to lace goods and in these the machines are busy for nearly all summer. Large orders have been placed for delivery in September, so that also in these goods, late buyers will get left entirely. Prices of these goods will not go down during this year, as maco cotton is high and will stay high, and wages will not go down. The production of these fine gauge goods is much larger than it has been before, but as the importers have been buying four to five times as much as usual, it is not nearly large enough to supply the demand.

Embroidered hose will again be one of the leaders for next spring and the patterns will be about the same as those of this season, only the stockings will be of poorer grade and the embroidery not as rich, as it is impossible to make up the goods for the same money as last year.

Jacquard hose will also be bought freely especially in small designs. In men's half hose very pretty patterns are already shown for next season.

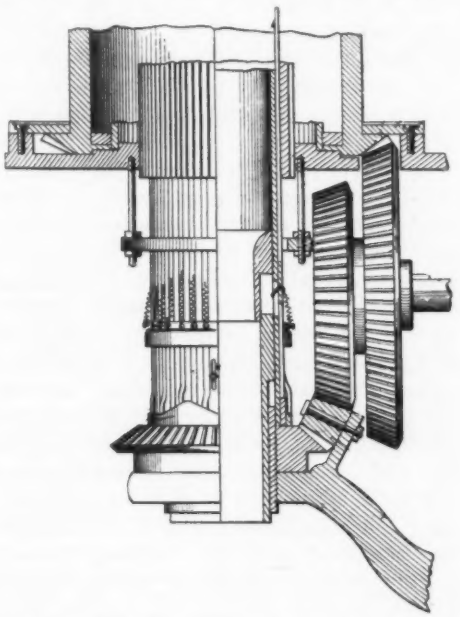
A TAKE-UP FOR KNITTING MACHINES.

The accompanying plans show an improved take-up, invented and patented by Bernard T. Steber, of Utica, N. Y., and by which, it is claimed, an even strain is applied to the loops of the fabric during the knitting process. Fig. 1 shows a portion of a machine equipped with the new take-up; Fig. 2, a portion of the ring for holding the web-holders in place. The inventor states that he has obtained better results when the web-holders are controlled with respect to the pull exerted on the fabric, reducing the pull as the goods come from the needles.

In Fig. 1 of the drawings is illustrated a portion of a cam-cylinder of a knitting machine, mounted upon the bed-plate of the knitting machine and provided upon its lower edge with a downwardly-facing beveled gear. The gear meshes with a correspondingly beveled gear, which is secured to a driving-shaft. The shaft is driven from any suitable source of power and operates to rotate the cylinder properly. The cam-cylinder is movably held in place on the bed-plate by a removable ring. Within the cam-cylinder is located the needle-guiding cyl-

inder, and between the needle-cylinder and the cam-cylinder is the usual skeleton guide-cylinder for holding the heels of the needles in position.

Within the needle-cylinder is the web-holder cylinder, which is formed with vertically arranged parallel grooves upon its outer surface for receiving and guiding the web-holders in their operation for pulling downwardly the fabric knitted in the needle-cylinder above. The lower end of the web-holder cylinder extends to and telescopes upon the upper end of a gear-cylinder, which is rigidly secured to an arm, which projects from the frame of the machine. Loosely



fitting about the gear-cylinder is a beveled gear-wheel, and secured to the upper face of the beveled gear is a cam-ring, arranged for reciprocating the web-holders at the proper time for enabling them to obtain new holds upon the knitted fabric as the same lengthens.

Within the gear-cylinder is arranged an inner cylinder, capable of regulating the stroke of the web-holders; above this cylinder and within the web-holder cylinder is mounted a shield or guard cylinder for protecting the fabric as it is drawn downwardly through the machine.

The springs of the straight web-holders draw them directly against the edge of the web-holder cam-ring, while the springs of the other web-holders draw them against the upper ends of the offset lower sections, and in turn force these offset sections against the cam-ring. In order to accommodate the movement of the hooked ends of the springs, the web-holder cylinder is cut away to form elongated apertures. The offset sections are provided with means for preventing them from dropping out of the cylinder in the event of the actuating-gear being removed at any time. For this purpose a pin is secured to the offset section of the offset web-holders and arranged to extend into the elongated recess opposite that particular web-holder. If the gear and the cam-ring are removed, the pins will engage the lower ends of the elongated apertures and limit the downward movement of the sections and prevent them from dropping out. The cylinder of the web-holders is supported in the machine by means of a yoke, which is connected with the bed-plate by means of depending rods.

The pull upon the fabric by the web-holders or rods varies the length of the loops in accordance with the position in which they are operated with respect to the point in the cylinder where the knitting operation is taking place. If the web-holders are lifted and pulled downwardly at the place where the knitting operation is taking place, the effect is the production of fabrics with loops of uneven lengths. To obviate this the cams are so arranged that they will not be beneath the part of the cam-cylinder which actuates the needles in the knitting operation. In addition to this it is necessary to have the cam-ring moved exactly in accordance with the movement of the cam-cylinder, so as not to destroy this relation between the cams of one and the cams of the other. In order to cause the cam-ring to operate with the same speed as the cam-cylinder is operated, the ring is driven by a beveled gear, a beveled pinion and an intermediate gear, which is pivotally mounted upon an arm or projection. The intermediate gear imparts movement to the gear and the ring in the same direction as that in which the cam-cylinder is moved.

The Annual Convention of the National Association of Hosiery Manufacturers.

This convention was held at Philadelphia on May 21, 22, and 23, at the Continental Hotel and was the most successful in the history of the organization. There was a large attendance of manufacturers from all parts of the United States and great interest was shown in the work of the convention and in the exhibition that was conducted in connection with it. The secretary, C. B. Carter, of Knoxville, Tenn., deserves great credit for the attractive program, which included a discussion of many of the most important questions affecting the hosiery industry at the present time.

F. L. CHIPMAN, PRESIDENT NATIONAL ASSOCIATION OF HOSIERY MANUFACTURERS.

In the absence of the president, Harold Lamb, of the Union Mfg. Co., Union Point, Ga., the first vice president, F. L. Chipman, of Chas. Chipman's Sons, Easton, Pa., occupied the chair. In a few well-chosen words Mr. Chipman called the meeting to order and introduced the Hon. John Weaver, mayor of Philadelphia, who gave the members of the association and their guests a very cordial welcome to the city. He called attention to the many attractions of Philadelphia and to the important position that the city occupies as a hosiery centre. The hosiery mills of Philadelphia, he stated produce one quarter of the hosiery manufactured in the United States. It is therefore peculiarly fitting that the National Association of Hosiery Manufacturers should hold its meeting in this great centre of the hosiery industry.

After the mayor's address the business of the convention proceeded according to the program previously announced. A unique and very interesting feature of the meeting was the exhibition, which gave the machine builders and yarn and supply dealers, an opportunity to place their machines and products on exhibition and demonstrate their advantages to the visitors to a degree that would not be possible in any other way. While a comparatively small number of manufacturers availed themselves of this opportunity, yet the merits of the exhibition were so apparent that it was the general opinion this feature of the annual convention should be made permanent. There were knitting, sewing, dyeing and winding machines on exhibition in actual operation. The hosiery manufacturers in attendance spent much of their time in the exhibition hall and some of the knitting machine builders took advantage of this opportunity to have the manufacturers visit their works in the immediate vicinity. Among the noteworthy exhibits were those of the following firms:

Universal Winding Co., Boston, Mass.; E. Jenckes Mfg. Co., Pawtucket, R. I.; Wildman Mfg. Co., Norristown, Pa.; Wm. Sellers & Co., Philadelphia, Pa.; O. F. Zurn & Co., Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.; Dennison Mfg. Co., Boston, Mass.; Morris & Co., Groveville, N. J.; Lowell Machine Shop, Lowell, Mass.; National Automatic Knitter Co., Philadelphia, Pa.; Wilfred Wells, Philadelphia, Pa.; Roessler & Hasslacher Chemical Co., New York City; Oswald Lever Co.; Geisenheimer & Co., New York City; E. T. Houghton & Co., Philadelphia, Pa.

At one of the sessions Chas. Schoeneman, of the Standard Machine Co., made a very interesting and instructive impromptu speech in which he called attention to the importance of co-operation between manufacturers and machine builders, stating that their interests are identical, that they were dependent on each other and that only by fair dealing on both sides could the best results be obtained.

At the last meeting on Wednesday afternoon the following officers were elected for the ensuing year: President, F. L. Chipman; first vice president, T. C. Withers; second vice president, Isaac Mossop; treasurer, C. B. Carter; executive committee, M. S. Gabriel and J. H. McPhail.

Following are the papers read at the meeting:

Hosiery Manufacturer and Commission Agent.

BY A. VICTOR VICTORIUS.

The commission man, or mill agent, stands between the manufacturer and the distributer. On the one hand he knows the capacity and faults of the manufacturer; on the other, he learns the wishes and requirements of the customer, and it is his duty to unite these two forces in harmonious accord.

In transmitting the ideas of the jobber to the mill, the agent resolves himself into a "bureau of information" for the manufacturer, and the more varied the information the more valuable do his services become. Not alone should he keep the manufacturer in touch with the wants of the jobber and with the ever-changing demands of the public, but he should also urge him to higher ideals in manufacturing and assist him to the attainment of them. Just as criticism has elevated the stage, so will it elevate any other art or science, and I maintain that the mill's best asset is the frank and honest criticism of its agent who thus encourages lofty standards, which in the end means higher prices. No business can make headway without constant accession of energy, for in these days of keen competition to stand still is to fall behind, and the best of today must be improved upon tomorrow.

The agent can give practical assistance to the manufacturer by pointing out:

(1) The errors that he is making.
(2) The good points in his methods.
(3) New ideas.

The commonest fault of domestic manufacturers is their lack of attention to little things. The manufacturer who gives close study to the minutest details, who strives to elevate the standard, who aims to perfection in each branch of work and who puts character and individual tone into his goods, is bound to command higher prices for his output than his neighbor, who is careless and indifferent in the execution of his work. Therefore you will see that higher prices are not entirely dependent upon the commission man.

In his position as outpost to the manufacturer, the agent sees the trend of affairs. He notes the reception which is accorded to any new creations, and this wide scope for observation enables him to be of valuable assistance, in particular, to those manufacturers who are distant from the market, and he truly conserves their interests only when he constantly gives suggestions as to improvement in style and general get-up of the particular specialty that he is making, and instead of blindly following the manufacturer, leads him into new and available fields that yield a greater profit.

This is a day of practice rather than of theory. Each man looks to his ultimate gain, and nothing else yields better results than a lofty standard of integrity and fair dealing, especially with the selling agent. Perhaps the most important suggestion that I can offer is to ask you to view the agent in a spirit of loyalty and fidelity. In his relations with his customers, he bases his representation on his own understanding with the manufacturer. He stands as your mouthpiece; on you depends the fulfillment of his promises.

I doubt if you know with what spirit and energy the commission man acts for you, if he knows that you stand behind him ready to fulfil the promises that he makes in your behalf. The incentive for work and application is largely taken away when there is fear that his efforts may be in vain, but if you imbue in him a spirit of confidence that he will not be deprived of the fruits of his labors, the result will rebound to your lasting benefit and gain.

It might seem at first glance as if my theme has been directed to the question of "How Can the Manufacturer Best Conserve the Agents' Interests?" but on a closer study you will see that our interests are one and identical and that the agent cannot conserve your interests unless you conserve his.

The commission man who does his duty thoroughly is in reality an adviser and should be considered the trusted counselor of the man who runs the mill, and their mutual advantage is largely enhanced by a closer personal relationship between the two.

Marketing Products.

BY J. H. McPHAIL, Nashville, (Tenn.) Hosiery Mills Co.

Economics might be called the ethics of industry. What ethics is to the moral life, economics is to the industrial life. In the pursuit of the latter we usually sacrifice the former, and yet who will deny that the greatest economy is often achieved when we pursue it with ethical tactics.

Economy, of course, means getting things done at the lowest possible cost. If quality is sacrificed to cheapness, it is called poor economy. So poor workmen or salesmen, though often cheap, are not always economical. Salesmen or sale systems are counted good or bad, according to the results produced. If the salesmen or sales system make money for us, we consider them good; if the reverse, we consider them bad. The salesmen or systems now employed, in the main, are not producing satisfactory results, or, at least, we are inclined to lay the blame for our failure to make money on our sales system. If this is true, the question arises, How can we remedy the evil?

Would a uniform system for all help us? Some of us have tried all three systems—the commission men, the broker and our own direct representatives—and some have succeeded in one way, who failed at the other and vice versa.

On the whole, we believe that manufacturing and selling the goods are two different propositions; that it would be better for the whole industry if it could agree upon a uniform system. The manufacturer selling through a special sales agency to the jobber, and let the jobber serve the retailer. This could be done either through a commission system or through a special organized sales agency, controlled and managed by the manufacturers themselves.

If our troubles arise through defects in our marketing systems, how can we remedy them? We have no right to blame our salespeople. They seem to be doing their level best for us. We believe in the main they are honest and loyal to us; therefore, the fault must lie in the system. So we find ourselves here today, gathered from points widely separated, at a great expense of time and money, for the purpose of taking counsel of each other and learning, if possible, what our ills arise from and if we can find a cure for them.

If we reflect, can we not agree that our troubles arise from the fierce competition that modern conditions compel us to wage in a relentless war with each other for trade? Are we not continually fighting each other? Is not our combat ably seconded by our salespeople and umpired by our customers, who uniformly decide the points against all of us?

We cannot expect quarter from our customers in price of terms, but should expect them to live up to their contracts. This is all that we can expect them to do. They are, on the other side, doing just what we do when we buy our supplies. It is not our business to look after the interests of the people that we buy from, nor can we expect our customers to look after our interests. We must do that ourselves. As long as we are engaged in a free-for-all fight we may expect no better conditions.

The question, therefore, is, What shall we do? And I answer, Cease fighting and co-operate.

Would iron and steel, with its enormous production, be selling at present prices if the U. S. Steel Corporation had not been formed? Would 90-cent nails be selling for $2.60 if the great iron masters had continued to compete instead of co-operate? Would 16-cent leather be selling for 36 cents if the tanneries had continued to compete instead of co-operate? Would the 14,000,000-bale cotton crop of 1904 have sold for 10 cents or more if the Southern Cotton Growers' Association had not been formed? And yet more iron and steel, more leather and more cotton are being consumed at these high prices than at the former low figures. What is true of leather, cotton and iron is true of many other commodities.

Association, organization, combination and co-operation is the order of the day in all parts of the world of industry. In fact, every field of human endeavor.

These results are the legitimate effects of a natural potential cause.

The mighty forces that have been made subservient to man in the discoveries and inventions of the nineteenth century are just beginning to bloom to a glorious fruition.

Every one engaged in productive industry is entitled to a fair return for his labors. If this cannot be attained under the competitive system of production and selling is it not immoral to combine or co-operate to this end? The laborer is worthy of his hire, from the humblest worker in your mills to the president or shareholders. Every one who contributes to industry, whether of brawn or brain or capital, is entitled to fair compensation, and if this cannot be gained by individual effort it should be no crime to obtain it by co-operation.

It is possible for large numbers of individuals or corporations to conduct individual enterprises, and co-operate in the purchase of supplies and the selling of products.

The success of the co-operative societies of England, both of mercantile aud manufacturing, proves that co-operation on a large scale is practical and beneficial to its members.

Co-operation in corporate form has belted the continent with bands of steel, over which the iron horse carries the commerce of a nation.

Co-operation has strung wires on land and under seas, over which flash the intelligence of a world with lightning speed. Co-operation plows the mighty deep with the leviathan and ocean greyhound, transporting the commerce of nations, and makes the most distant peoples neighbors and friends.

Honest, earnest co-operation of the hosiery manufacturers will cure many troubles and abuses which now afflict them.

If 75 per cent. of the hosiery manufacturers will honestly and loyally trust each other and co-operate in the purchase of supplies and the marketing of their goods, they can accomplish wonderful results. It does not necessarily mean higher prices to our customers, but it does mean elimination of many trade abuses, and will insure that peace and quietude that is the right of all.

It does not mean that we would have to merge into a great corporation all our individual enterprises as the industries mentioned, or sink our individuality in a so-called trust. It means that it is possible for us to remain independent and conduct our manufacturing as we have heretofore with possibly some desirable amendments or reforms that would redound to our advantage. It means that we can cure our ills by co-operation in buying our supplies and marketing our goods; we can reduce the cost of selling our products; materially, we can eliminate the cancellation evil and compel our customers to keep their contracts.

By co-operation we could employ the very highest experts in dyeing, in knitting machinery, in cost accounting and for systemizing our mills, these experts going from mill to mill when wanted.

Coming together in organized associations, talking over our troubles and accusing each other of high crimes and misdemeanors, will not help us much, unless it leads to immediate action.

New conditions have arisen; new alignments of human endeavor are forming with almost lightning rapidity. The impossible of yesterday is accomplished today. The wonders of the world are not of the past, but of the future. What is the secret

of this wonderful activity? Co-operation, linked to these great discoveries. Co-operation of individuals in corporations, in associations, in municipalities, in States and nations. Co-operation has given us our splendid educational systems; has given us our postal systems, and co-operation is preventing the latter from further development.

Radical changes from old methods are repugnant to many who would rather endure the ills they have than to try new experiments. But desperate cases require heroic treatment. Is not the condition of the hosiery trade, as a whole, verging on the desperate zone? Have not material and labor been steadily rising for the past three years, with no corresponding increase in the price of our goods? "How can all this be accomplished?" you ask. By co-operation; by organization.

The benefits of co-operation might be enlarged upon, in buying, manufacturing and selling, but no doubt they are apparent to all who have given the subject even casual thought.

Dyeing and Finishing Hosiery.

BY R. P. SMITH, Smith, Drum & Co.

Aniline black has come to stay. The art of finishing, at first, was not a matter of serious thought. A fine stocking showed its quality. It was made of yarn equal to its appearance. Lots of cheap stockings were being made and dyed black, but they showed their quality; now it is the finish and the black that is most looked for, and this is how it came about. In a small mining town of this state, the employe who worked on the oxidizing machines became careless, and let the goods run much over the time, spoiling the lot. The employer came in, and he saw the floor covered with dust. I will leave out his remarks—they would not sound well, nor look well in print, but he discharged the man.

On handling the very much oxidized contents of the oxidizing machine, he found the goods, as he expected, rotten, but the expression of angry despair slowly gave way to a look of wonder. In appearance, the stockings were a beautiful lisle, although made from very poor yarn. The thought came to him, "Could I do it without tendering?" Well, we all know he did. His business grew to great extent; cases of goods came from all over the country, were piled on his pavements, waiting their turn to be dyed and finished. He failed to patent his discovery, and it comes to you free of royalties. But there were other applications for patents, and suits were brought and lost.

In Wilkes-Barre, another firm in the hosiery business had their work dyed and finished at the place where lisling on hosiery was discovered, until they quarreled over help, and the one who dyed and finished refused to do his work. After the refusal to dye, the work was sent to Philadelphia dyers, who had a good black but did not give the finish. The Wilkes-Barre concern made a good stocking, but could not sell them. They were in despair. To quote them, they were "up to either finish their goods better, or shut down their mill." Then history repeats itself. Necessity was again the mother of invention. They boarded a stocking and passed it over a gas jet. The results pleased them, they designed a machine, had it built, and sent the first batch of goods to the Philadelphia dyers. Word was immediately received that there must have been a fire on the train, the goods had a burnt smell. They answered, "Never mind the burnt smell; dye them." Like many other inventors, they neglected to get United States protection for their ideas, so again you benefit by an inventor's neglect.

But although they did not protect their invention, the idea led others to make an application for patents, and as no interference was offered a patent was granted. A second application by another party caused interference, and before the interference suit was decided, they had spent some thousands of dollars, with the result that the second application wins, not only on the machine, but separate patents on the use of a form, the condition of the stocking, etc.

Today nineteen hundred dozen pairs of hose may be automatically singed and stripped from the boards by one machine in a day of ten hours. And that is how matters stand in the dyeing and finish of hosiery. I would like to add, that the claim of each concern to have the best black is rather amusing. Comparisons are made only with those who are taking the greatest pains and spending small fortunes in suitable machinery. One of the largest makers of hosiery was considering a new black and a change of machinery. The watchdog of their finances, the treasurer, a very fine fellow, sent out to the jobbers one of their young men to get samples of the best black on hosiery. He brought in ten samples, each house claiming superior black to anything on the market, and they found that the whole ten samples were their own goods.

Immigration.

BY S. H. WEIHENMAYER, Blue Ridge Knitting Co., Hagerstown, Md.

Immigrant labor can be employed only in a limited way. Such being the case, I would deem it better policy to endeavor to induce them to seek employment on the farm, thereby permitting those now working on the farm to secure employment in the factories, which seems to be the ambition of many now working on farms.

Immigrant labor, in my estimation, would be of but little assistance to hosiery manufacturers on account of present help refusing to work by their side; they could not be taught the trade on account of lack of intelligence and on account of their not being able to speak the English language.

The only practical way to use this labor would be to start a colony close to a town where employment could be given to both sexes. With proper schooling the coming generation will become Americanized and they will become greater consumers, so that by the time we feel the effect of cheap competition from China and Japan which is sure to come, probably before we are aware, a greater amount of our home production can be consumed by a larger home market which can be protected by a higher tariff if necessary.

Steam Boiler Insurance.

BY HUGH NELSON, Casualty Company of America.

It is my present purpose to deal briefly with that form of insurance known as "Use and Occupancy," or "Profit and Income" insurance, with more particular reference to its adaptation to the needs of the steam user of today. By the term "Use and Occupancy," as generally applied, is understood the class of insurance that guarantees to indemnify an assured in case of partial or total destruction of his property as the result of fire, for such loss of profits and income as may have been sustained. This policy has been broadly underwritten for many years, and its value as an aid in extending the benefits obtained from the fire policy is most thoroughly appreciated and popularly accepted by the insuring public.

In view of this fact, it seems very strange that for so many years, and in fact nearly down to this day, there has been no effort made in this country to extend the "Use and Occupancy" feature to other classes of hazard. In this our friends across the water have shown us the way, as there are several companies in Great Britain, and we believe one in Germany, underwriting "Use and Occupancy" as applied to such hazards as cyclones, tornadoes, boiler explosions and epidemics, and the contracts to cover such hazards have been extended by these underwriters to meet the requirements of modern ideas, and the advance of scientific thought. No sensible man doubts for a moment that the havoc wrought by a cyclone, a tornado or a bursting boiler, can equal in force and intensity, in so far as immediate results are concerned, that wrought by the fearful element of fire.

The manufacturer of today, who is also a steam user, fully realizes that he has within the four walls of his boiler room a power which when harnessed and properly controlled is an innocent and effective medium for the propulsion of engine and machinery, but when through the carelessness of engineer or fireman, or through some latent defect which neither the practiced eye nor the blow of the hammer of the expert inspector can discover, it bursts its bonds, there is no more fearful engine of destruction.

It was in 1866, just forty years ago, that the first steam boiler policy written in this country was issued, providing in addition to a periodical inspection, indemnity for loss of property as an assured might sustain as the result of the explosion of his boiler or boilers. It was not until some twenty years later that provisions were made in the contract for the protection of the assured in case of loss of life or personal injury. From that time until 1905, while there had been changes in some of the conditions of the policy form, the main features of indemnity remained practically unchanged. It seems strange that this should have been the case, as other policy forms were broadened to conform to the more modern ideas of underwriting and the more approved types of machinery and mill equipment. The assured, however, was largely to blame for such a condition of affairs, as for years the subject of inspection of the boiler had been the one important feature in the eyes of the manufacturer, and the idea of inadequate protection had been dismissed without consideration.

"I carry boiler insurance only for the inspection service" has been a common saying in the past, it being apparently the idea that the best inspection would prevent loss. The number of disastrous boiler explosions during the past few years, some of them occurring after the most careful, expert inspection, proved the fallacy of any such idea.

Within the past year, the scope of the steam boiler policy has been extended to cover the daily loss of profit and income, due to partial or total destruction of plant, and depreciation or elimination of rental value of premises. There are three forms of the "Use and Occupancy" contract, as so applied, viz: manufacturers', commercial and rental; the first, as its name implies, being intended to indemnify the manufacturer for any loss in the amount and value of the manufactured product; the second, the commercial form, applies where goods are sold but not manufactured, and the third, or rental form is framed for the protection of the owner of property under rental, whether it is a mill, store, office building, hotel or private dwelling.

It will thus be seen that the textile manufacturer or selling agent of today can secure protection for practically every form of loss as the result of the action of steam, as under the one covering, indemnity is provided for loss or damage to property; for loss of life and personal injuries and for loss of profits and income.

This form of insurance, it seems to me, should also appeal most strongly to the user, for the further prosecution of his business or the betterment of his mill. As a factor in the system of credit rating "Use and Occupancy" as applied to all hazards must for the future play a prominent part. No one will be willing to put out his money when he realizes that a possible catastrophe may cause the loss of the entire amount, unless the necessary protection of an insurance corporation is furnished as a guarantee. The same argument would naturally apply in the case of the manufacturer desirous of maintaining the best rating of credit, as it is only a question of time when the financial rating companies will insist upon ample protection being maintained before the coveted grade of A1 can be secured.

Bleaching Hosiery and Knit Goods Generally.

BY DR. U. SCHOEDLER.

Not the least important of the manufacturing processes through which hosiery and knit goods have to pass is that of bleaching. On this depends the strength and life of the goods be they white or colored. Let us therefore briefly examine the action of the different bleaching agents now on the market, and I will keep myself strictly in bounds of every day parlance, so that those of my hearers who are not familiar with technical or chemical expressions will readily understand the subject matter.

The lime-bleach (chloride of lime, bleaching powder, as it may be called) acts on the coloring matter in the fibre of cotton goods by oxidizing it

to a colorless compound, but in the laboratory or on a sample scale this bleaching can be regulated so finely that no damage occurs to the goods; in mill work, however, handling thousands of pounds in thousands of gallons of liquor the chances of damage are infinitely increased, so much so that such authorities as Sansone, Hummel, Hurst, Posselt and others have pronounced it impossible to prevent tendering of the cotton fibre when lime-bleached on a large scale. To the chemist this is at once self-evident when he considers the chlorine salts with which the bleaching solution is charged, which penetrate and to an appreciable extent remain in the interior of the fibre notwithstanding repeated rinsings. But chlorine and its salts are known as very corrosive agents.

While therefore the advent of chloride of lime bleaching made it possible to whiten cotton goods in a few hours as against months consumed in the old grass-bleach, it gave to the consumer a much inferior article as to strength and durability, and it was only tolerated as long as there was nothing better.

This brings me to the consideration of an improved process, that of bleaching with peroxide of sodium, through which I think I am able to show that the disadvantages pertaining to the lime treatment are satisfactorily obviated.

Peroxide also bleaches by oxidation of the coloring matter in the fibre, but no by-products, except glauber salts, are formed in the bleach-bath, and these, together with the de-colorized coloring matter in the goods, are washed away in the after-rinsings. That this is a fact is evidenced firstly, by an analysis of the bleached goods, which any competent chemist can make; secondly, by the fact that through innumerable comparative strength tests it has been shown that the fibre has not lost any of its strength; thirdly, by the fact that the goods do not go-back in color, that is, do not yellow-up in storage, exposure or washing.

The increase in cost of this most modern process compared with the old chemic bleach does not amount to more than 25 per cent. per hundred pounds of goods, a difference so small that the advantages gained thereby outweigh it tenfold. The "talking points" gained thereby for the sale of the goods are most convincing when you consider that you can guarantee to the jobber, that the goods will retain their white and not come off their shelves streaked and of a muddy yellow color; to the consumer, that he buys permanently good-looking articles which will outwear several of the old class; to the reseller that he will improve his reputation for selling reliable goods.

Until recently woolens and mixtures have been bleached with sulphur or bisulphite. This is what we call a "reduction" process, meaning that the action of the sulphurous acid reduces the natural coloring matter in the fibre to a colorless compound, which, however, is not soluble and therefore remains in the fibre. You will note that "reduction" is the opposite to "oxidation," which we have touched on under cotton. Furthermore, you are, of course, aware that sulphur or rather the sulphurous acid left in the goods is extremely hard to get rid of, no matter how much washing the goods receive. Indeed, it is rather necessary to keep it in so as to hold the white as long as possible, at least until the goods are sold. There is lots of oxygen in the air and the aforesaid coloring matter has for it the same feeling that a drunkard has for his dram; it will get it by fair means or foul. It then combines with it to form the original color-compound and your goods have "yellowed-up."

Again, for mixtures, meaning wool and cotton or any animal fibre with vegetable fibre, by rights and with due regard for the consumer, the lime bleach should not touch the stock because the animal fibre is disintegrated; the sulphur-bleach however, should be kept away from it because of its carbonizing—burning—effect on the vegetable fibre.

This damage is not so quickly apparent, and therefore most of the mixtures have heretofore been sulphured. All sulphur-bleached goods are readily recognized by the smell which through that process adhered to them, and which, where such garments become moist through perspiration, is most disagreeable.

All these self-evident reasons have decided a considerable number of the best mills to adopt this agent for their wool and mixture bleaching.

It can readily be shown that there is no reason, in fact or in theory, why any fabric, be it what it may, should be affected injuriously by peroxide of sodium, which at the same time is absolutely odorless.

In conclusion I can assure you that from an experience of ten years spent among hosiery and knitting mills I can without risk of challenge assert that not only peroxide of sodium bleaching the only rational treatment the goods can receive, but that it offers a sure and safe relief from all the many complaints of tendered and discolored goods, of poor selling stock, or returned shipments which are now worrying you.

Following is a partial list of those present:

Alabama.

W. H. Johnston, Birmingham.
M. D. Rosenau, Tuscaloosa.

Delaware.

John L. Sutphen, Wilmington.

Georgia.

James Bennor, Macon.
Samuel A. Carter, Atlanta.

Illinois.

James W. Shaw, Chicago.
P. C. Withers, Mt. Vernon.

Indiana.

J. W. Koberle, Fort Wayne.
Harry Pfleger, Fort Wayne.

Maryland.

J. Irving Bitner, Hagerstown.
H. J. Crosson, Hagerstown.

Massachusetts.

Frederick H. Bishop, Boston.
T. E. Connor, Westfield.
Geo. W. Foster, Lowell.
Wm. E. Hall, Lowell.

Wm. R. Horn, Lowell.
Geo. B. McCallum, Northampton.
P. G. McMahon, Florence.
M. H. Merrill, Boston.
M. A. Metcalf, Boston.
J. H. Musgrove, Pittsfield.
Frank L. Nagle, Boston.
Lawrence Neebe, Boston.
Earl A. Thissell, Lowell.

Michigan.

A. Galbraith, Bay City.
D. L. Galbraith, Bay City.

New Hampshire.

W. F. Duffy, Franklin Falls.
Geo. D. Mayo, Laconia.
A. W. Sulloway, Franklin.

New Jersey.

C. E. Barnitz, Delanco.
David Cottrell, Hammonton.
W. J. McElmoyl, Groveville.
Abe Sheppard, Salem.
John P. Sheppard, Salem.
R. D. Sheppard, Salem.

New York.

D. H. Bates, New York.
W. H. Berry, New York.
Howard W. Bible, New York.
S. M. Bissinger, New York.
G. B. Bradley, New York.
R. A. Carter, New York.
Chas. F. Chase, New York.
Chas. H. Clark, New York.
Joseph Colter, New York.
John R. Deardon, New York.
C. H. Dennig, New York.
J. Van Wyck Du Bois, New York.
F. Vois Gutman, New York.
J. H. A. Klauder, Amsterdam.
Geo. M. Lillie, New York.
G. Henry May, New York.
Hugh Nelson, New York.
Dr. Ulrich Schoedler, New York.
L. Wayland Smith, New York.
T. P. Spitz, New York
S. H. Steele, New York.
A. V. Victorious, New York.
J. P. Voorhees, New York.

North Carolina.

J. A. Bradford, Statesville.
E. Lee Campe, Randleman.
C. M. Carr, Durham.
W. F. Carr, Durham.
J. J. Crow, Monroe.
Frank Wilcox, Tryon.

Ohio.

W. L. Fay, Elyria.

Pennsylvania.

T. B. Abbott, Philadelphia.
E. R. Allen, Philadelphia.
Frederick W. Ancona, Philadelphia.
E. Anderson, Philadelphia.
H. E. Ashmore, Philadelphia.
D. B. Austin, Philadelphia.
H. J. Baughman, New Cumberland.
H. B. Beale, Philadelphia.
Walter N. Beatty, Philadelphia.
L. H. Beckley, Philadelphia.
Chas. H. Bennett, Philadelphia.
H. J. Bigony, Mohnsville.
D. B. Boersma, Philadelphia.
Chas. Bond, Philadelphia.
Thomas W. Bowers, Philadelphia.
C. H. Brown, Philadelphia.
Wm. T. Buck, Philadelphia.
Geo. R. Callaghan, Philadelphia.
Chas. Chipman, Easton.
Frank L. Chipman, Easton.
D. G. Clemons, Pottstown.
Geo. H. Cromie, Philadelphia.
Chas. T. Davies, Reading.
Chas. Donovan, Philadelphia.
Henry F. Drenk, Doylestown.
J. W. Durbin, Williamstown.
H. Eddishaw, Philadelphia.
W. Godey Ellis, Philadelphia.
Frank E. Elwell, Jr., Philadelphia.
Will A. Engarde, Philadelphia.
John H. Evans, Philadelphia.
Arthur J. Fleming, Philadelphia.
Henry B. Fried, Souderton.
M. S. Gabriel, Allentown.
J. A. Gilmer, Philadelphia.
John M. Given, Pittsburg.
E. B. Gorman, Philadelphia.
George W. Grove, Philadelphia.
John W. Hepworth, Philadelphia.
A. W. Hicks, Philadelphia.
B. J. Hoffman, Philadelphia.
A. S. Hornberger, Sinking Springs.
E. S. Hyde, Philadelphia.
James I. Jackson, Philadelphia.
E. W. Jenkins, Philadelphia.
C. J. Jones, Philadelphia.
C. Walker Jones, Philadelphia.
L. Kaufman, Bridgeport.
E. W. Knapp, Philadelphia.
Winthrop C. Knowles, Philadelphia.
A. R. Kreider, Annville.
J. Wm. Landenberger, Philadelphia.
B. B. Le Fleur, Philadelphia.
M. Lieberman, Milton.
Chas. S. Madeira, Fleetwood.
F. A. Mason, Philadelphia.
Frank T. McElroy, Steelton.
W. P. McClure, Philadelphia.
C. R. Miller, Philadelphia.
Edward C. Miller, Philadelphia.
H. A. Miller, Topton.
John W. Miller, Philadelphia.
Jos. B. Miller, Philadelphia.
Melchisadek Miller, Philadelphia.
K. Moorhead, Philadelphia.
R. J. Morningstar, Philadelphia.
Isaac Mossup, Wiconisco.
W. W. Mutchler, Philadelphia.
James A. O'Connell, Philadelphia.
C. W. Odell, Philadelphia.
H. C. Pegge, Philadelphia.
P. R. Rahm, Philadelphia.
Fred A. Rakestraw, Philadelphia.
Edgar D. Rank, Williamstown.
John Reber, Pottsville.
H. A. Romberger, Philadelphia.
M. H. Rudderow, Philadelphia.
H. H. Schenck, Manheim.

Chas. Schoeneman, Philadelphia.
Thomas Searles, Pottstown.
J. T. Shimer, Bethlehem.
Walter W. Sibson, Philadelphia.
Fred W. Simons, Frankford.
E. L. Smith, Philadelphia.
R. P. Smith, Philadelphia.
A. Stone, Philadelphia.
A. W. Taylor, Philadelphia.
James Taylor, Philadelphia.
Emil Thalheimer, Reading.
Chas. N. Torkington, Philadelphia.
W. C. Urner, Spring City.
C. H. Vanderbeck, Philadelphia.
A. W. Walkden, Philadelphia.
Chas. A. Warner, Fleetwood.
W. S. Waterman, Philadelphia.
Wilfred Wells, Philadelphia.
W. T. Westerman, Philadelphia.
C. A. Wignall, Philadelphia.
Fred M. Wood, Philadelphia.

Rhode Island.

Geo. E. Boyden, Providence.
L. E. Lent, Jr., Pawtucket.

Tennessee.

T. M. Johnston, Knoxville.
John M. Jones, Jr., Sweetwater.
J. H. McPhail, Nashville.
F. A. Weiss, Lenoir City.

Virginia.

Joseph G. Burton, Lynchburg.
T. B. Conway, Jr., Danville.

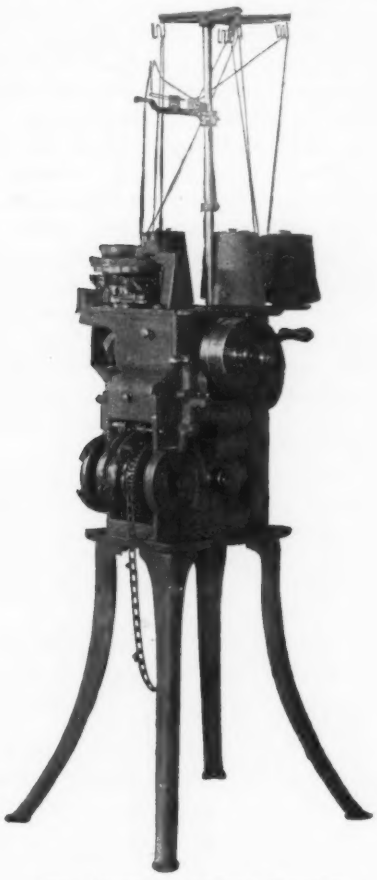
THE NEW "BANNER" HOSIERY KNITTING MACHINE.

The illustration shows the "Banner" hosiery knitting machine, a new full automatic knitter manufactured by the Hemphill Manufacturing Co., 321 Pine St., Pawtucket, R. I., and has some striking points of novelty and merit. The machine was devised by Joshua D. Hemphill, a man of twenty-six years' experience in knitting and building hosiery machines. This is the fourth hosiery knitting machine to be designed by Mr. Hemphill, three of which are in successful operation today. The "Banner" machine is his latest and embodies the most practical points suggested by his long experience.

Some of the advantages claimed for this machine are as follows:

The speed at which it can be run on plain work is about twenty-five per cent. faster than that of any other machine now in use. Because of the principle on which it is constructed the most perfect plating work is produced at a speed of 336 revolutions per minute. It has run at this speed on tender yarn for several months. It is guaranteed to run at this speed with three changes of yarn and produce perfect work.

The plate on which the bobbins are placed is stationary, which allows the use of bobbins holding four or five times as much yarn as is used on other machines. Each thread



THE "BANNER" HOSIERY MACHINE.

is run through grooves that are also stationary. This is an advantage as the operator can see at a glance whether each thread is being run into the fabric, while when the bobbins revolve it is not easy to determine whether the threads are being taken up properly. Because the bobbins are stationary more tender yarn can be knit successfully.

In the construction of this machine the cylinder revolves and is perfectly balanced,

which prevents friction and enables the machine to run light and with less wear on the different parts.

The floor space required is less.

The working parts are so arranged that the operator can adjust the work quickly and with ease.

The manner of transferring is unique; the transfer is made with one revolution of the cylinder. There is no raising of the needles or adjusting of the cams to place the needles in position before or after transferring.

The needles can be removed at any stage of the knitting process without removing any part of the machine, and the sinkers can be exchanged without taking off a sinker cap. There is an open space between the cylinder and sinker head through which the lint and waste drop, thus preventing accumulation and enabling the machine to run freely for a long time without cleaning. This feature must be greatly appreciated by knitters who find it necessary to take their machines apart at frequent intervals for cleaning.

The needles are in plain sight and are not of such shape as to make them more expensive than the ordinary needle.

The work is in plain view of the operator as the knitting proceeds and defects can be quickly detected.

The machine is built for four changes of yarn, which makes it possible to knit a wider range of goods and is equally good on ladies', children's or transfer work.

There is no perceptible vibration when the machine is running at full speed; the machine is driven by a three-quarter inch belt.

It is simple in construction, compact, durable, not likely to get out of order and with comparatively few parts. It is claimed that because of its positive action and perfect balance it can be run at 325 or 400 revolutions with less wear than on some other machines that are run from 225 to 275 revolutions per minute.

The Hemphill Manufacturing Co. have equipped their shop with the most improved modern machinery and special tools for building the "Banner" machine. The people connected with the company know what the trade wants and feel confident that this machine is not only new and different in many respects from other types, but that it pos- There is one in continuous operation at 321 sesses distinct advantages. To determine these points it should be seen running. Pine St., Pawtucket, R. I., and the fullest investigation is invited.

AN IMPORTANT COURT DECISION.

An event of more than usual interest to the knitting trade is the decision of the United States Court of Appeals in the suit brought by Scott & Williams against the Fisher Knitting Machine Co. for infringement of patent. The decision is in favor of Scott & Williams and is in part as follows:

Bellis was the first to produce "a fleecing ribber" and the new fabric known as "fleece rib." Machines for producing a fleecy inner face on plain knit fabrics had been known for some thirteen years prior to the invention of the patent in suit. Ribbed goods had been fleeced by carding the body threads. But plain knit fabrics were inelastic, and carding the body threads weakened the garment. The demand for a fabric which should obviate these objections is indicated by the commercial success of complainants' and defendants' manufactures. That the construction of a machine capable of producing such a fabric was not obvious appears from the thirty-one prior patents introduced by defendants, no one of which showed a solution of the problem, and from the inability of defendants' experts to construct from the prior art any practical fleecing ribber, or to satisfactorily indicate how the prior structures could be so adapted as to produce a fleece rib, without radical and substantial modifications involving the exercise of invention, and by the further very significant facts that the Scott Patents, Nos. 577,788 and 577,789, for rib-knitting machines, applied for prior to the issue of the Bellis Patent, proceeded upon a theory, and were constructed upon a plan, radically different from the suggestions furnished by the prior art as testified to by defendants' experts, and that, after the Bellis disclosures, Scott abandoned his former construction, followed Bellis, and finally secured a half interest in the Bellis Patent.

Bellis' object was to construct "a machine which is capable of producing a ribbed knit fabric with backing," described in his patent therefor, consisting of "a two-ply rib-knit webbing," or provided with "a backing on the ribbed-knit fabric, which may be of a different material from that of which the body of the fabric is composed," to be introduced "while the latter is being produced." The result, the production of a "ribbed-knit fabric with backing," was accomplished by means of "jacks or loopers operated to act in conjunction with the needles to interlace a supplemental thread with the meshes composing the body of the ribbed fabric." "But to produce a backing on such fabric while the latter is being produced devices must be provided which bring the backing or supplemental thread from the inside of the machine over the needles at certain and predetermined intervals, so

that it may be interlaced with the meshes of the fabric, as will be hereinafter more fully described," and the jacks must rise to push the thread "over a needle to be interlaced with a mesh formed by such needle."

There is no statement in the patent that its object was to construct a machine capable of producing loops to be fleeced.

It is admitted that the machine of the patent in suit makes a fabric described in the Bellis fabric patent as one which can be finished in one operation, and that when so finished it is a completed article with a substantial backing before it is fleeced, while defendants' fabric has only floating loops for its backing and is not a completed article until it has been fleeced.

It is further admitted that there are substantial differences in the construction and operation of the two machines, and that the construction of defendants' machine follows in certain details the machines of the prior art.

In the light of these facts we are brought to a consideration of the status and scope of the patent in suit and of the single issue in the case, that of infringement.

The criticisms upon the language of the patent itself will first be considered.

It is objected that there is no reference in the specification to the fact that the object of the invention was to produce a fabric capable of being fleeced. But it is well settled that the patentee is not obliged to state all the objects of his invention and that he is protected in all the beneficial uses thereof within its scope. And, here, no statement as to fleecing was necessary because the patent in suit concerned only a new "improved ribbed knit fabric . . . produced and finished in one operation" (Patent No. 561,558) on the patented machine. Whether it should thereafter be used as thus finished or subjected to a new operation for fleecing was immaterial.

Furthermore, such a construction for fleecing was old in plain knit goods; there is no evidence that the fabric was ever practically used for any other purpose; and the uncontradicted testimony is that this was the sole purpose to which the invention related.

The references to making the backing of different material are criticised by defendants as referring merely to a double faced material. But such references might equally well suggest a fabric adapted for fleecing, such as a cotton body with a fleece lining of wool.

It is contended that while the stated object of the invention in suit was such that the "extra thread is tightly interlaced with the loops," etc., . . . "whereas Fisher's (defendants') extra thread is not interlaced, is not secured to the main fabric at all," etc. But the Fisher Patent specifically describes means "to engage with an extra thread and secure it on one surface of the fabric, forming floating loops," and explains how said loops are "caught on the inside of the fabric by the loops of the main thread."

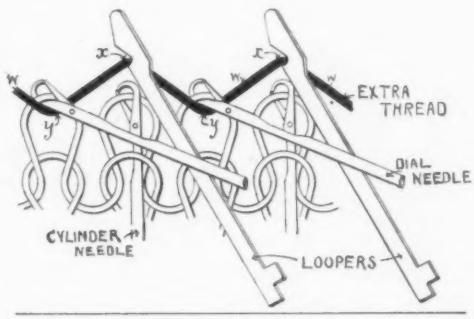
Whether the defendants' thread is not, in fact, interlaced will be discussed later.

Much stress is laid on the language quoted above which indicates that the supplemental thread must be brought "from the inside of the machine over the needles," etc. But a reference to the specification shows that this statement was made in the course of a description by the patentee of the specific machine illustrated in the drawings, and that such limitation is nowhere else found, except in claim 5, not here in suit, but which covers this specific construction.

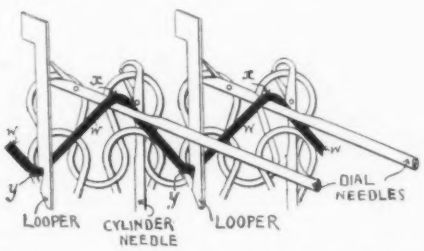
But it is argued that as Bellis insists that however his machine be modified it must be "provided with jacks or similar devices to bring a thread over a needle to be interlaced with a mesh formed by such a needle," and as defendants do not thus manipulate their thread and do not interlace the loop in the body of the fabric, they do not infringe.

The differences in the operation of the two machines and in the construction of the loop are fairly shown by the following diagrams:

COMPLAINANTS' MACHINE



DEFENDANTS' MACHINE



The operation and result of the two devices thus differ in that in the one the supplemental thread is pushed from the inside outward over the cylinder needles and thereby firmly interlaced in the body of the fabric; in the other the supplementary thread is pushed in from the outside and interlaced, "secured" or "caught on the inside of the fabric," as the patentee says.

In the light of the foregoing discussion it is seen that not only was Bellis the first to produce a fleecing ribber and a fleece rib, but he was the first to produce a machine which interlaced loops on a double ribbed fabric. He was the first to conceive a practical method and means for obviating the mechanical difficulties attendant upon the introduction of the extra needles. It may, therefore, fairly be said that he fulfilled the requirements of a generic invention in that he devised a machine which performed the function of looping on a ribbed fabric, a function never performed

thereon by any earlier machine, and thereby produced a result never before produced, namely, a ribbed fabric capable of being fleeced, and that in doing this he exercised invention of a high order.

And inasmuch as there is no prior art limiting Bellis as the first to produce a machine capable of providing loops on a ribbed fabric adapted to be fleeced, we think his invention is entitled to be regarded as of such primary character as to embrace defendants' machine, which performs the same functions of looping and engaging a thread in the fabric by a combination of means covered by the terms of the claims in suit and operating on the same principle, with the same resulting fleecing capacity.

It is argued by defendants, and found by the Court below, that the Bellis invention is not a meritorious one because its machines are inoperative or impracticable for successful commercial operation.

This argument rests upon the following contentions:

Bellis, in his subsequent Patent, No. 574,129, for an improvement, consisting in the addition of a ring to his prior machine, says as follows:

"The upper peripheral edge s of the ring S also serves to direct the finished fabric, which is drawn by suitable take-ups, downward, so that the newly formed backing loops do not come into the way of the jacks to be next actuated, which, as has been found, was the case where no such ring S was provided on the machine, the jacks on such machines generally catching the loop previously formed and tearing on its upward motion the threads apart, destroying in this way the backing, but this is entirely obviated by the use of the said ring S."

All the Bellis machines, with perhaps one exception, are provided with this ring. Scott & Williams, the owners of one-half the patent in suit, have patented and make a different machine, and certain hostile experts testify that, in their opinion, the Bellis machine is impracticable for various reasons.

This last contention is met by proof that the Bellis machines with the ring improvement have been in successful commercial operation for some eight years, and the theories advanced to show why the Bellis machines would not run successfully are denied by witnesses who claim to testify from actual observation.

The Scott & Williams machines are different in some particulars from the specific construction of the patent, but the testimony of complainants' experts, not disproved by defendants, is to the effect that these machines are within the patented construction.

The patented ring is an improvement on the original machine and remedies a defect therein. But this is a mere detail improvement and, in effect, merely amounts to an enlargement of the dial of the patent. We are unable to see, therefore, how it affects the meritorious character of the invention.

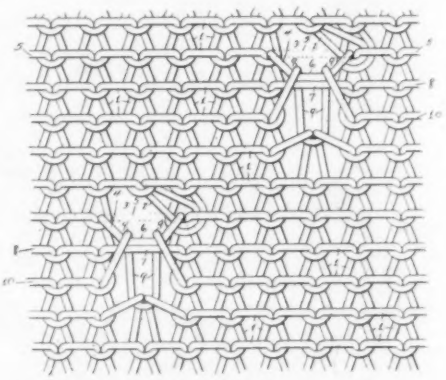
It is frequently a characteristic of generic inventions that their first embodiments work imperfectly, and where the imperfections may be remedied, as in this case, by what amounts to a mere readjustment of relative sizes, such change does not affect the character of the underlying creative conception.

In these circumstances, the majority of the Court is of the opinion that the decree of the Court below as to the defendant corporation must be reversed, with costs.

Inasmuch as it does not appear that the defendant Kernan has any connection with the infringement, except as an officer of said corporation, the bill should be dismissed as to him, with costs.

A KNITTED FABRIC.

An open-mesh knitted fabric, recently patented in this country, is shown in the accompanying illustration. The inventor states that the principal objects of the invention are to reinforce and give body to the fabric, to enable it to maintain its shape, and to give a more symmetrical form to the meshed openings or apertures left by the



transfer of stitches from one needle to another.

The ordinary knitted loops or stitches of which the principal portion of the fabric is composed, are shown at 11.

To render the fabric more open or porous, a stitch is transferred at intervals from one needle to another, such transferred stitches being shown at 2, 2, the result being to produce in the knitted fabric an aperture, 3.

By adapting the mechanism to transfer certain stitches, various ornamental patterns of openwork fabric may be produced, as is well understood by those skilled in the art.

In proceeding with the ordinary knitting after the transfer of a stitch the thread forming the next following course of stitches

would stretch without intermediate support from one of the last previously knitted untransferred loops or stitches to the second loop or stitch formed in the same course, tending to produce a somewhat slazy fabric and giving to the interstice or aperture left by the transferred stitch, a contracted unsymmetrical form due to the stretching of the thread in a comparatively straight line across the lower end of the opening.

To improve the firmness or body of the fabric, as well as its appearance, there is formed immediately below each aperture left by a transferred stitch, a tuck-stitch or double stitch, whereby the thread in the course immediately beneath the aperture is paralleled and reinforced by the thread of the second course below the aperture, and the thread of the first course below is stretched and drawn out of a straight line by the intermeshing therewith of a loop in the thread of the third course.

Referring more particularly to the drawing, 4 represents the thread in the next course below the transferred stitch, which if not formed into a tuck-stitch would extend, as indicated by the dotted lines, 5, in a straight line across the lower end of the aperture left by the transferred stitch, thereby greatly diminishing the size of the aperture. As shown by solid lines, however, the thread forms a loop, 6, extending parallel with a a loop, 7, in the thread, 8, of the next following course and is intermeshed with loop, 9, of the thread, 10, of the second following course, which loop, 9, in the operation of ordinary knitting would interlock with loop, 7, of the thread in the course, 8. The pull exerted by the loop, 9, upon the loop, 6, due to the elasticity of the fabric, draws the loop, 6, downwardly to enlarge and make more symmetrical the aperture, 3, while the extending of the loops, 6 and 7, parallel with each other serves to reinforce and give body to the fabric at a point immediately below said aperture, rendering the aperture less liable to be distorted and drawn out of shape by a stretching of the fabric.

The doubling up of the stitches or loops, 6 and 7, forms what is known as a "tuck-stitch," and is accomplished by the use of a cut-presser to act upon the thread, 5, this presser being cut to receive and not close the beard of the needle from which the stitch has just previously been transferred, so that the stitch, 6, (shown in the drawing), is left upon the needle and not cast off, and when the thread, 8, of the next feed or course is fed to the needle, the latter will then carry two loops or stitches, 6 and 7, which are subsequently cast off by a presser and cast-off mechanism, in the usual manner.

Softening Knit Goods.

Editor Textile World Record:

We make men's ribbed goods in light and heavy weights, and at present are having considerable trouble in getting our goods soft. This is our process of dyeing: Boil out six hours, using one and one-half pounds caustic soda and one-half pound soda ash to each 100 pounds of goods. Rinse in cold water 20 minutes, put in chloride of lime bath 1° Tw. Then take out and wash 20 minutes; put in anti-chlorine bath 1 1/2° Tw.; run 20 minutes; rinse 20 minutes, then put in dye bath, using clear water, adding three pounds neutral soap to 100 pounds cloth; run 10 minutes, add dyestuff; run five minutes, then turn on steam, running 10 minutes; then put in six pounds salt and bring to a boil; run 30 minutes, take out and extract. Can you tell us what is the trouble?

Caledonia (621).

I can suggest a process that I think will give better results than that used by your correspondent. Boil the goods at least 12 hours in a 2 per cent. solution of caustic soda; that is, two pounds of soda to 100 pounds of cloth. Wash in a solution of three parts of chip soap to one part of sal soda. Enter the goods into the lime bleach at 1° to 2° Tw., leaving them about three hours, or until white. Extract and let lie on the table to age, overnight if possible. Boil in clear water for 20 minutes, then enter into the anti-chlorine solution at 1° to 2° Tw. for about half an hour. Extract and boil in clear water for 20 minutes. Cool the water in the washer till lukewarm; then add the bluing solution, which is prepared as follows: Boil the blue for two hours, then add one quart acetic acid to every gallon of the blue liquor. Rinse the goods for 15 minutes in warm water. Change the water and add the softener, which is prepared as follows: Two parts chip soap to one part of Olo soffine, made by Bosson & Lane, Boston, Mass. Boil until mixed, and add two quarts of this solution to every washerful of goods and run in hot water for 20 minutes. Rinse, extract and dry. I think this process will make the goods softer than they are at present. Orlando.

The samples submitted are firmly knit and the

ribs are pronounced. Several things might be done to make them softer, and one is the use of a softer twisted mule spun hosiery yarn. The rib might be knit somewhat slacker, also. In place of the caustic soda and soda ash used in boiling out the goods, two and one-half pounds sal soda might be used. The formula given for bleaching and dyeing is good, but I think the time for washing should be extended. Goods cannot be washed too well or too much, and if any lime is left in them it has a tendency to make the goods harsh. Caledonia says the goods are extracted after dyeing without washing or softening. If an emulsion of Turkey red oil was added to the dye bath the goods would be softer, or they could be softened after dyeing by placing in a lukewarm bath with five pounds of softener to 100 pounds of goods, and then dried. There are many good softeners for cotton, but the dyer can make his own softener with castor oil and sal soda, or olive oil and sal soda. These will serve the purpose very well and be economical in cost.

Baumwolle.

The samples submitted seem to be very fair, considering the quality of stock used. If the quantities of caustic soda and soda ash had been doubled, the boiling out cut down to three hours and the rinsing done in warm water, the goods would have been softer. In handling the goods great care should be taken to avoid all unnecessary pulling and stretching on spreaders, turners, etc. The slower the goods are dried the softer they will be when finished. A slight nap on the back of the goods would make them feel much softer.

Madison.

Curly Knit Goods.

Editor Textile World Record:

In knitting material on our flat Claes & Flentje machine, we find in making the goods circular that after they are taken from the machine and cut they roll at the edges. We have tried pressing the material, but as yet have not been able to solve the difficulty. Can you advise us what to do? It is not only with the wool and worsted, but also with linen and cotton.

Moretown (645).

Goods knit on circular machines always roll at the edges when they are taken from the machine and cut. Usually this is not considered a drawback, as an experienced workman can easily roll them back and keep them even. If the process of manufacture requires that they shall not roll, a good plan would be to make the cloth in the roll. When the cloth is dry and is being rerolled, a small perforated pipe connected with live steam can be arranged back of the spreader and steam blown through the cloth as it rolls up. This will dampen the cloth and the rolls will have a more uniform width. The cloth should be cut while damp and put through the different operations as soon as possible.

Laramie.

It is difficult to give an answer to this question without seeing either the machine or the cloth made from it. In my opinion the trouble might arise from several causes. Flat work is very apt to curl at the edges, but in this case it may be that they are making the selvage too tight. Or it may be that on this particular machine a reverse twisted yarn is required. This will sometimes cause a great deal of trouble. I would advise trying a little looser selvage first; then try steaming the edges before cutting, and if this does not overcome the difficulty should try the reverse twisted yarn.

Onota.

All knitted cloths as taken from the machine will roll at the edges when cut. In those goods that are scoured and dried before cutting this difficulty is avoided. In others that are cut as they come from the machine without being scoured there are only two ways of overcoming it. One is to wet the cloth and then dry it; the other is to steam it until it is thoroughly damp. This is done by making a steam box or chest in which several rolls of cloth are placed and covered up as tight as possible, and the steam turned on for about half an hour or longer as may be required to dampen the roll thoroughly all through.

Then if the roll is taken out and run over the turning machine and spreader so as to have the roll of uniform width, it can be cut without rolling at the edges. Pressing the cloth would not overcome the difficulty unless the cloth was dampened first. This is readily seen when we consider that the housewife cannot iron and press clothes smoothly without having first dampened them.

Lafayette.

Infants' Worsted Hosiery.

Editor Textile World Record:

What is the best way to finish infants' worsted hosiery?

Perry (662).

I presume that this hosiery is knit in the white and then dyed black and that the query has reference to the finishing process after dyeing. The best finish is obtained by the usual process of boarding and drying, then placing the goods between press papers, and pressing with a steam plate press, in the following manner: First turn the steam on the plates, then run up the press, pressing as tight as the driving belt will allow. After the steam has been on for fifteen or twenty

minutes, turn it off and cool the plates by turning on cold water. Leave the goods in the press another ten or fifteen minutes after the plates are cold, then loosen the press and they are ready to be taken out and folded.

This method of pressing I have found to give the best results on worsted knit goods, either hosiery or underwear, as it gives a glossy, silky finish to the goods. If this kind of finish is not desired a simple cold pressing between the press papers will give a smooth finish without any gloss.

Esek Easton.

Stains on Knit Goods.

Editor Textile World Record:

What is the cause of the stains on the piece of knit goods enclosed? They develop in the boiling-out kier in which we use 1 1/2 pounds of caustic soda to 100 pounds of cloth. The kier is made of cypress wood and we use pine timber to hold the cloth down. Redwood (675).

I have made several tests on the samples you sent me and in my opinion the stains are made by the caustic bleach. The cypress wood kier is all right if it is whitewashed inside with lime occasionally, to prevent the goods from coming in contact with the wood. The blocks for packing the kier had better be of spruce, as pine is apt to bleed a little and it is possible the pine blocks have caused the stains. It would be a good plan to change the blocks and note results before trying anything else. So many things might cause these stains that it is necessary to experiment until the right cause and remedy are found. It is my opinion that the caustic bleach is responsible for them as I have had the same difficulty with this bleach. It is a quicker process than the other, but I am sure it is no cheaper when everything is taken into consideration. The only way to get rid of the stains is to change the bleach, especially if the water is hard. There is a certain amount of residue extracted from the goods during the process of boiling, and which is forced through the blowpipe. If the bleacher will examine his kier when he has stripped it in the caustic boil he will see how far this residue has spread around the blow pipe and where the suction has drawn it into the goods. If the stains are due to the caustic the proof will be found right there.

The stains will also be caused by letting the liquor get low in the kier. One thing that used to help us was to flood the kier from the bottom after the boiling was done, before letting off the liquor. A gentle boiling afterwards does a lot of good.

It is not stated whether the goods are put in the kier in the piece or in the garment, but in either case let the stained goods be put to one side until there are enough to boil reasonably well in the kier, then put them in the kier with the following solution: To every 100 pounds of goods use one pound of soda ash and boil until dissolved. When dissolved and ready to pass into the kier, add 8 ounces of ammonia to every 100 pounds of goods. Do not add the ammonia until the liquor is running into the kier. Ammonia being very volatile its effect will be lost if it is put in the hot liquor and allowed to stand. Boil the goods gently for four hours and follow the regular process, taking into consideration that they have been treated once before.

If the stains are light this treatment will remove them, but goods with heavy stains may be classed as seconds as they can never be made perfect.

Henry Douglas.

Recent Knitting Patents.

KNITTING MACHINE. Thread Feeding Device. Circular. 818,908. Ellis I. O'Neill and William N. Taggart, Philadelphia, Pa.

KNITTING MACHINE. Pattern. 819,407. William W. Burson, Chicago, Ill.

New Agency.

The National Automatic Knitter Co. have taken the agency in Philadelphia and surrounding towns for the National Button Hole Machine, built by the National Machine Co., Mamaroneck, N. Y. Particulars may be obtained by addressing the National Automatic Knitter Co., 724-728 Cherry St., Philadelphia, Pa.

KNITTING MILL NEWS.

New Mills.

Alabama, Talladega. A new hosiery mill is to be erected here by company which will be organized with capital stock of $50,000. Among the incorporators are M. B. Lewis, M. H. Lewis, T. J. Mathews and M. E. Lewis. The plant will be equipped for manufacturing cotton hosiery.

*New Hampshire, Keene. We learn that nothing definite has yet been done concerning the Monadnock Hosiery Co. recently reported incorporated. If certain matters can be arranged it is said that the company will pay in its capital and start business.

*New York, Jeffersonville. The Jefferson Knitting Company has an equipment of 12 knitting and 3 sewing machines, on men's, boys', ladies' and infants' knit goods. The product is sold direct. J. Rubenstein is president of the company; Sam Gilinsky, treasurer, and Henry Gilinsky, superintendent.

North Carolina, Haw River. J. A. Long is president of the Regina Hosiery Company operating a plant at this place on seamless hosiery; W. H. Childrey, secretary and treasurer, and J. W. Johnston, vice-president.

*North Carolina, Hickory. The new plant for the Hickory Hosiery Mills is well under way and it is expected that operations will begin about Sept.

1st, making ladies' hosiery. Later they propose manufacturing men's and misses' hosiery. Operations will start with equipment of 27 knitting machines, one sewing and 6 loopers. Company has been incorporated with $100,000 capital. C. C. Bost is president; W. P. Cline, secretary and treasurer, and J. A. Cline, superintendent.

*North Carolina, Statesville. Work will start as soon as building material can be secured on the new plant for the Bradford Knitting Mills, of which Eugene Morrison is president. They contemplate being ready to start production of goods in 5 months. No other details as yet arranged.

Pennsylvania, Mohn's Store. A. S. Hornberger, of Sinking Springs, is making preparations for starting a new plant with capacity of 100 dozens daily, underwear, at this place, where a new building is being erected. It is stated that later hosiery may be made.

Pennsylvania, Philadelphia. The Dunwoody Hosiery Mills have just been started up by William B. Dunwoody at 3719 Filbert St. The plant will be equipped with 20 National knitters, 10 of which have already been delivered and are now in operation on ladies' lace and lisle hose made from 40/2 Combed Egyptian yarns. The production of the plant will be sold direct.

*Pennsylvania, Philadelphia. The Blue Ribbon Hosiery Co., which received charter last year, expects to start operations in about two months. This concern will manufacture cotton hosiery. The location will be reported in a later issue.

*Tennessee, Chattanooga. The Mission Knitting Mills, recently organized, have begun operations. This plant is equipped with 12 knitting machines and one sewing machine, making 84 needle half hose. Product is sold direct. M. Martinet is superintendent of the plant and J. P. Tyffe, buyer.

*Tennessee, Chattanooga. Although work will start at once on erection of new buildings for the new plant in which J. L. Hutcheson is interested, the company has not yet been organized. It is proposed to be incorporated with capital stock of $150.000, Mr. Hutcheson to be treasurer and W. H. Reddick, superintendent. They will make cotton warp cassimeres and will equip the mill with 7,200 mule spindles, 12-60 inch cards and 200 narrow looms. A dye house will also be attached. Goods will be sold direct. Electricity will be the motive power.

*Tennessee, South Pittsburg. W. B. Davis will be proprietor of the new hosiery mill which will be erected here. About 200 people will be employed.

Enlargements and Improvements.

Alabama, Birmingham. The Jefferson Hosiery Mills, at North Birmingham, are increasing the machinery and improving facilities at the plant.

*Connecticut, Winsted. We have been advised by the Winsted Hosiery Co. that they are planning a storehouse, 40 by 66 feet, 2 stories. This does not mean any additional machinery nor increase in production.

*Georgia, Barnesville. The Oxford Knitting Mills, reported making an addition to the bleachery and installing some new knitting and finishing machines, will increase the capacity of the mill from 350 to 400 dozen per day. Mr. F. M. Stephens is now secretary and treasurer of the plant.

Georgia, Columbus. The Perkins Hosiery Mills, which recently completed installation of 4,000 spindles in the plant, propose adding 1,000 more. The company, now operating 160 knitting machines on hosiery, proposes installing machinery for making other knit goods.

Illinois, Mt. Vernon. The Royal Knitting Company has increased the capital stock from $25,000 to $50,000.

Mississippi, Columbus. The Columbus Hosiery Mills will increase capacity of the mill. They propose adding 50 additional machines to the present equipment.

New York, Elmira. A new building is under construction for the Elmira Knitting Mills, to be used for storing bales of cotton.

New York, Honeoye Falls. A meeting of the stockholders and directors of the Ideal Knitting Co. was held recently and J. H. Barnard was elected president of the company; J. D. Martin, vice-president; E. G. Brooks, secretary and treasurer, and Geo. T. Nuttall, manager and superintendent. The company has placed an order for 25 full automatic knitters and a steam press is to be installed. This company makes a specialty of double sole work on carded and combed yarn.

New York, New Hartford. The Holbrook Insole Co.'s building has been leased by the Lewis Knitting Co., Sauquoit, and will be operated as a branch plant. About 50 people will be employed.

New York, New York. The Ocean Bathing Suit Co., 29 W. Houston St., who have been manufacturing bathing suits from the piece, have equipped their plant with knitting machines and are now making a line of knitted bathing and gymnasium suits, selling direct. They buy worsted and cotton yarns.

New York, Nichols. The Nichols Knitting Mills are to install eight new knitting machines and three ribbers in the plant.

*New York, Oswego. The Ontario Knitting Company has leased two floors in the Oliphant Building for storage purposes. The armory recently purchased for that purpose will not be ready for some time.

New York, Perry. The Perry Knitting Company has recently placed a repeat order with the Saco & Pettee Machine Shops, Newton Upper Falls, Mass., for drawing frames.

New York, St. Johnsville. An addition, 60 by 45 feet, two stories, will be built to the Union Knitting Company's plant on North Division Street. The finishing department will be installed in the new annex.

*New York, Sauquoit. The Lewis Knitting Company of this place, owing to the increased demand for their line of children's cotton ribbed underwear, have leased the building of the Holbrook Insole Co., at New Hartford, and have it fully equipped to increase their output 400 dozen per day. This new mill will give them a capacity of 1,400 dozen daily, of their various lines, composed entirely of children's wear. This concern has been established eight years and the increased demand renders the new mill necessary in order to take care of the wants of their customers.

*New York, Troy. The Wright Health Underwear Co., operating the Aetna Mills, has leased the Wayside Knitting Mill and started same with full complement of carding, spinning, knitting and winding machinery, to be run as an adjunct to the Aetna and Mohawk River Mills. This mill is required to replace the plant at North Pownal, Vt., destroyed by fire, last December.

New York, Troy. The Wright Health Underwear Co., operating the Aetna Mills, has leased the Wayside Knitting Mill and will put same in operation as soon as the necessary machinery has been installed.

North Carolina, Durham. The Durham Hosiery Mills will shortly install 3,100 additional spindles in the plant.

Pennsylvania, Philadelphia. The Simons & Struve Hosiery Co., Elizabeth and Unity Sts., Frankford; and Kensington branch at York and Jasper Sts., have leased the old Lanark Mills at the lower end of Frankford and will commence removing their machinery to that location June 1st.

*Pennsylvania, Philadelphia. The Liberty Bell Hosiery Mills, Main St., Frankford, report an addition to their finishing department, having recently put in a new dryer with a capacity of 250 dozen per day.

Pennsylvania, Reading. Eighteen new knitting machines have recently been installed in the I. X. L. hosiery mill.

*Tennessee, Chattanooga. The new Davis Hosiery Mill, Avondale, is nearing completion. This is a two-story brick building, 200 by 60 feet and will be equipped with the latest improved knitting machinery and will be a model plant in every way.

Tennessee, Niota. The Crescent Hosiery Mills have awarded contract for a two-story brick addition, 40 by 60 feet, to be built to the mill.

Virginia, Portsmouth. The Parker Hosiery Mill & Dye Works will be enlarged with an addition, 150 by 90 feet, two stories, brick. Capacity of the plant will be greatly enlarged.

Mills Shutting Down.

Pennsylvania, Bristol. M. C. Hughes, who has for many years been operating the knitting plant here on women's and children's cotton hosiery and underwear, has decided to close the plant out and sell its equipment. The machinery is now being run on the orders on hand and will be shut down as soon as they are finished.

Facts and Gossip.

California, San Francisco. The Saxony Knit Goods Co.'s mill was destroyed by the recent fire in this city. The comany proposes rebuilding, but will locate elsewhere. Temporary offices are in Oakland, Cal.

Connecticut, Naugatuck. The Board of Trade is reported as considering a proposition from out of town parties relative to establishing a knitting factory at this place.

Massachusetts, Pittsfield. The Musgrove Knitting Company is contemplating increasing capacity of the plant and will probably lease another floor in the Steam Power Building.

New Jersey, Plainfield. The Watchung Knitting Mill, which has been in operation since last September, making ladies' summer weight vests, with equipment of 5 knitting and 6 sewing machines, contemplates removing to Cohoes about July 1st.

New York, New York. The Buster Brown Hosiery Company has been incorporated with capital stock of $65,000. Albert H. Whitmore, Reginald Pierce and Herman H. Saunders are interested.

New York, Oneida. The Oneida Hosiery Company has discontinued the dyehouse at this place and all that work is now being done at the Waterville branch. Work is under way on their new mill, which will increase the present capacity about one-third

New York, Utica. The Capron Knitting Company will start work at once on erecting a building to be used as a dye house. The new building will be 100 by 40 feet, one and one-half stories high.

New York, Waterville. On account of improved water and finishing conditions, the Oneida Hosiery Company has decided to remove their finishing plant from Oneida to this place.

North Carolina, Haw River. The Regina Hosiery Company has been incorporated with capital stock of $25,000, by J. A. Long and others.

North Carolina, Hickory. W. P. Cline and others are reported interested in erecting a hosiery mill at this place.

Pennsylvania, Hanover. It is reported that quite a large hosiery mill is to be started in this town which will employ in the neighborhood of 300 operatives.

Pennsylvania, Philadelphia. David Joffe, Jacob Rositzky and Joseph Rabinovitch are applying for a charter under the name of the Defiance Knitting Mills. It cannot be said at this time where the mill will be located or what it will manufacture.

Personals.

W. T. Howard, overseer of spinning for the Perry Knitting Co., Perry, N. Y., has resigned and is succeeded by his second-hand, Frank Mohari.

William Eastman, of Lowell, Mass., who is to start a factory for the manufacture of men's half hose in Woonsocket, R. I., was in town making arrangements for the early commencement of the work.

W. W. Norcott, late superintendent of the Indianapolis Knitting Mills, Indianapolis, Indiana, is no longer connected with that concern.

Frank Hayner has accepted a position with the Alpine Knitting Co. of Pittston, Pa., as assistant superintendent.

Willis G. Rogers, formerly superintendent at Cedartown, Ga., has accepted a position with the Russell Mfg. Co., Alexander City, Alabama.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Hosiery Knitting Machine. The Hemphill Mfg. Co., Pawtucket, R. I., are placing on the market an improved knitting machine for hosiery, which is described and illustrated in this issue.

Slasher Comb. The Draper Co., Hopedale, Mass., have recently introduced an improved slasher comb, notice of which appears in another part of this issue.

Steam Brush for Woolen Goods. Theodore Saur, Bielitz, Silesia, Austria. A steam brush for woolen goods, which is described and illustrated in another part of this issue.

Grinding Machine for Calender Rolls. Dronsfeld Bros., Oldham, England. An improved machine for grinding calender rolls, which is said to be very strongly built and so constructed that heavy bowls can be driven without vibration. The setting wheels are fitted with scale collars graduated to one-thousandth of an inch.

Fire Appliance. Merryweather & Sons, London, S. E., England. A cradle for holding hose in position ready for use in case of emergency. When a fire breaks out a valve is opened and the hose is unwound by gripping the nozzle and pulling it toward the spot where it is to be used. As the coil unwinds the water fills the hose.

Cloth Shearing Machine. The Tasker Engineering Co., Sheffield, England. An improved construction for the revolvers of a cloth shearing machine.

Steel Bobbin Boxes. Joseph Stubbs, Manchester, England. An improved bobbin box made of steel for winding and gassing frames.

Automatic Loom. Thomas Warman, Bradford, Manchester, England. A new loom by which the shuttle is changed automatically.

Waste and Shoddy Mule. John Hetherington & Sons, Manchester, England. An improved woolen mule specially designed for spinning short stock, such as shoddy and cotton waste. It embodies many new features that combine to make it a very efficient machine.

Warp Winding Machine. F. H. Goslin & Co., Woodley, England. An improved warp winding machine designed to run warp dyed yarn back to the bobbins. It enables yarn to be dyed in the form of warps and then rewound for use in fancy goods.

Cloth Measuring and Marking Machine. Robertson & Orchar, Dundee, Scotland. A machine that measures and automatically marks the goods in yards and half yards on the edges, the yards being marked in figures and the half yards in dashes. The machine can be used for measuring only and without the marking device if desired and will deliver the cloth in folds or wound on boards.

Loom. Grossenhainer Webstuhl und Maschinenfabrik, Grossenhain, Germany, have recently made some important improvements in the Crompton loom motion, by which it is claimed the harnesses are driven positively and harness skips thus prevented.

Circular Shuttle Box. Oberlausitzer Webstuhlfabrik, Neugersdorf, Germany. An improved circular shuttle box which, it is claimed, affords important advantages not only over the former circular box, but also over the ordinary vertical box.

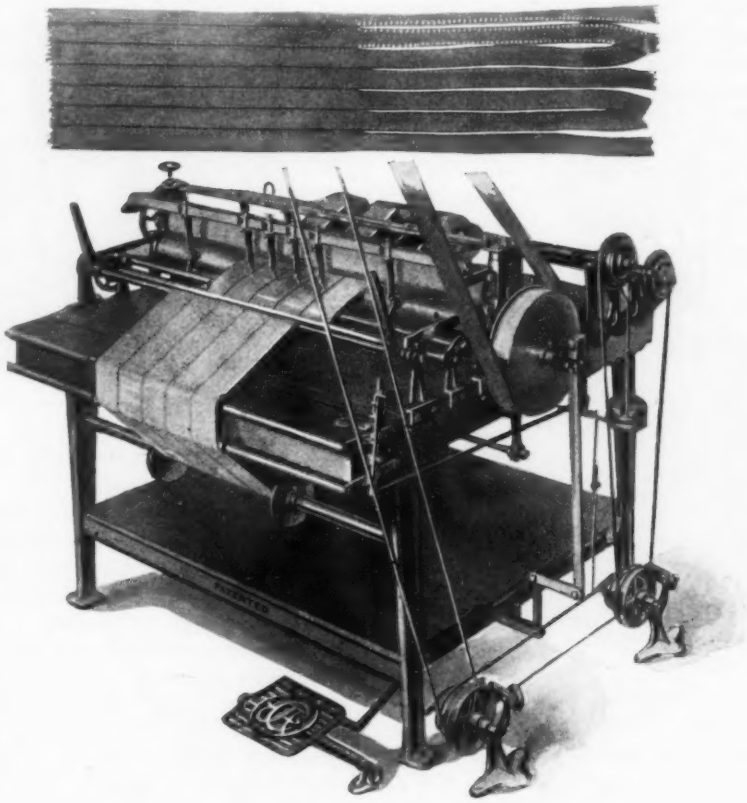
Yarn Dryer. Friedrich Haas, Lennep, Germany. An improved yarn dryer. Among the advantages are improved conditions for the workmen. The yarn is hung on racks outside the machine and these racks are then run in front of the machine on a railway track and the skeins passed to the dry room.

CLOTH SPLITTING MACHINES.

Heretofore ribbon manufacturers have been prevented from availing themselves of the undoubted economies of weaving two or more widths together by the fact that splitting them in the loom necessitated finishing the single edges separately. This resulted in manifest disadvantages, such as fraying of the yarn at the edge. Other objections added to these prevented the weaving of ribbon splits from being generally adopted. The process of cutting the ribbons after finishing has removed the objections to splits and at the present time manufacturers can weave two or more widths of ribbon together and split them for market after the goods are finished.

The Cameron Machine Co., 4th Ave. and Baltic St., Brooklyn, N. Y., have perfected a cloth splitting machine adapted not only for splitting ribbons, but also a wide range of fabrics. Quite a number of ribbon manufacturers have recently put their broad looms on multiple width ribbons, splitting them on the Cameron machines. When the cutting is properly done the ribbons present an attractive appearance and are suitable for most of the uses to which fast edge ribbons are applied.

Mr. Cameron believes that the use of splitting machines for ribbons will be gradually extended to fabrics that the manufacturers now consider must be woven in single widths. He has recently issued an attractive catalogue describing his various cloth cutting machines adapted not only for ribbons but for other goods. Manufacturers interested in this branch of work should not only secure a copy but should consult the Cameron Machine Co. regarding their requirements. These machines are being used for the manufacture of handkerchiefs, doilies, lace curtains, neck wear, underwear, surgical bandages, embroideries, trimmings, bias seam binding, and



STYLE "D" RIBBON CUTTING MACHINE.

all other lines of manufacture that use considerable quantities of cloth strip for any purpose.

THE BRUNN-LOEWENER SYSTEM FOR SOFTENING WATER.

The accompaying illustration shows the mechanism used for the Brunn-Loewener method of softening water, a system that was invented abroad and is in wide use in both Europe and this country. It is controlled by the American Water Softener Co., Mutual Life Building, Philadelphia.

The importance of pure water for textile

FIG. 1.

manufacturers and power users is so well known as to need no emphasis here, but we will call attention to the claims for the Brunn-Lowener system of purification.

Fig. 1 shows the crude water flowing through a large pipe into the chamber of the oscillating receiver. As soon as this chamber is filled the centre of the gravity changes and the receiver is tilted so that the water flows into the tank, at the same time bringing the other chamber beneath the supply pipe. Above the receiver is a tank containing the softening solution, which flows into the oscillating receiver through a valve operated by a lever, which is raised at each oscillation of the receiver. The operation is thus completely automatic and the machine can be adjusted for any required amount of softening solution.

Fig. 2 shows the mechanism located at the ground level for mixing and handling the softening solution. In the upper tank fresh burned lime is slacked in sufficient amount for twelve hours' operation. After slacking the valve is opened and the solution drops

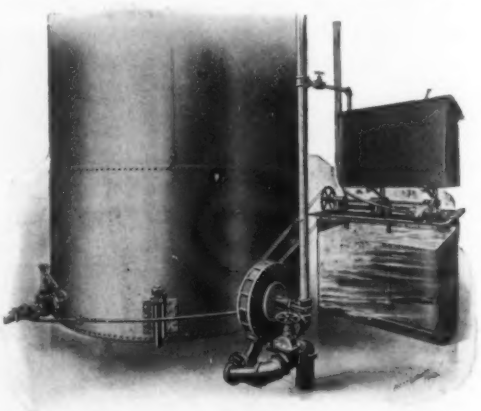


FIG. 2.

into the lower tank through a screen that removes all foreign matter. Soda ash is added in the right proportion and the whole solution is kept in constant motion by the agitator. The power for running the mechanism is furnished by a positive acting water motor. With an effective pressure of three pounds it furnishes sufficient power. These solution tanks are made to contain from 12 to 24 hours' supply and consequently it is necessary for the man in charge to be in attendance but fifteen or thirty minutes per day, after which the machine operates automatically.

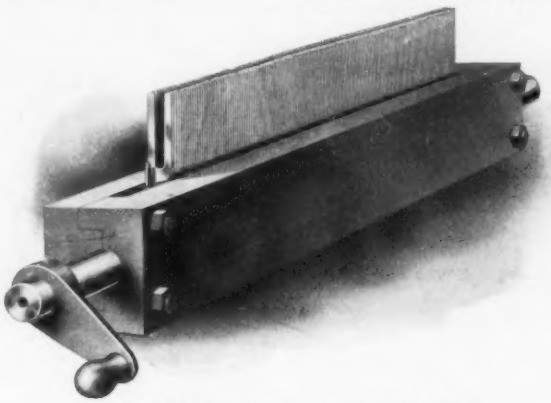
Among the claims made for the Brunn-Loewener system are the following: It is of the simplest construction of any water softening apparatus now in use, there being practically nothing to get out of adjustment. No skilled labor is required. The cheapest reagents known, lime and soda ash, are used. The chemicals are mixed at the ground floor. Flowing water furnishes the necessary motive power. A very strong lime solution is used making it possible to reduce the size of the tanks and save space. The

action is automatic. The mixture of the chemicals is uniform. It is possible to change easily the adjustment of the machine to suit different conditions of the water to be softened. It is adapted for both hot and cold water.

The American Water Softener Co. is prepared to adapt the system to special requirements and will be glad to receive inquiries from interested parties and to refer them to users of the Brunn-Loewener system.

THE RHOADES DOUBLE DENT SLASHER COMB.

The accompanying illustration shows the patent Rhoades double dent slasher comb manufactured by the Draper Co., Hopedale, Mass. The advantages of this comb have been greatly appreciated by manufacturers.



THE RHODES DOUBLE DENT SLASHER COMB.

It gives twice the separation of the ordinary comb by use of the double-prong offset dents preventing the threads from sticking, rolling over, and crossing. It is especially applicable to stripes and colored work; also for yarns requiring a thin dent at present. The improvement is of course made manifest in the weave-room, where the smoother beams weave off much better, causing less warp-breaks, less hitch-backs and less uneven work.

The German tariff system is scientifically adjusted for the retention of the home trade in all its branches, so far as they can satisfy the home demand. Their system is to begin with the capture of the finished branches of the trade.—British Tariff Commission.

DANGERS OF ACCIDENT.

BY C. M. HEMINWAY.

The purpose of this article is to point out the danger—the possibility for serious and costly accidents, that is ever present in the engine guarded only by the engineer and the governor.

The number of things that can happen, that have happened, to place an engine beyond the control of either, is a source of wonder to those who have investigated the subject.

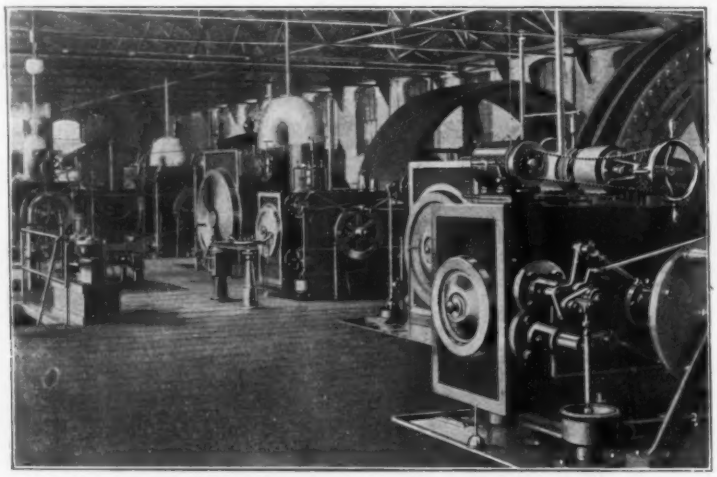
In one case, a workman passing through the engine-room with a ladder over his shoulder caught the ladder in some overhead wires. In disengaging it he broke the wires and, as he passed on, they fell, became entangled with the governor, stopped it, and only the timely entrance of another workman, who happened to know how to shut down the engine, prevented what would almost surely have been an expensive smash-up. The engineer was busy at the other end of the room for a few minutes, with his back toward the engine, and did not know what had happened until it was all over. He might never have known but for the rare good luck that perhaps saved his life.

There are very few plants in which the engineer can be constantly within reach of the throttle, and there have been cases where even that would be of no avail.

In another case the driving belt broke on a belted engine running smoothly and in the best of condition. One of the broken ends flew up and broke the nozzle from one of

the overhead sprinklers. It was a matter of only a few seconds until the governor belt was drenched with water. Of course, the governor ceased to govern, and in about the time it takes to tell it, the engine was a wreck.

Both of these instances show how useless the best of governors are under circumstances that may arise in any plant; how such things happen in spite of frequent and careful inspection; and they suggest prevention, if prevention is possible, rather than insurance, which rarely if ever, makes good all the losses following such accidents.



AN ENGINE ROOM EQUIPPED WITH THE "MONARCH" ENGINE STOP.

A means of preventing engine accidents, that has met with marked success, one that has been tested successfully in many emergencies is illustrated herewith.

This mechanism is not expensive, it operates directly on the throttle and can be applied without shutting down.

By means of push switches at convenient points about the plant, the engine can be stopped promptly in case of accident to men or machines at a distance, and the courts have already recognized in employers' liability actions the preventive value of the system in such emergencies.

The system acts automatically in case of overspeeding, so that the engine will be brought to a stop in such a case before any damage can be done, and without regard to the action of the engineer or the governor.

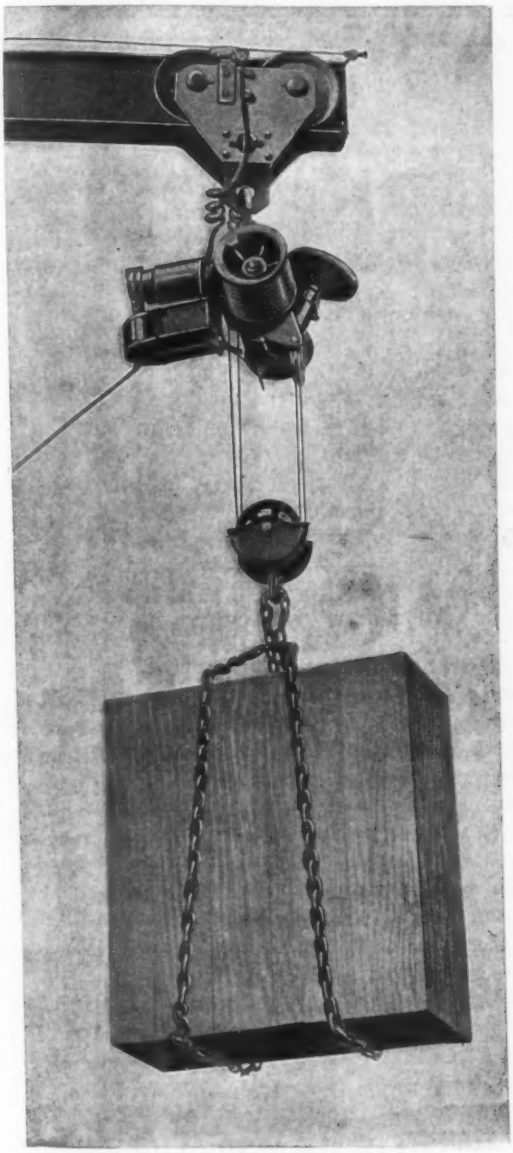
THE YALE & TOWNE PORTABLE ELECTRIC HOIST.

The electric hoist shown in the accompanying illustration is manufactured by the Yale & Towne Manufacturing Co., 9 to 15 Murray St., New York City. It is shown in a plain overhead trolley on a projecting I-beam track for hoisting material from freight cars and trucks on the ground floor to the upper stories of a factory or warehouse.

Two men with the best hand hoist performing such work will handle 32 tons of material per day, one man working with the four ton electric hoist shown in the illustration will handle the same tonnage and deposit it on the second floor in just 30 minutes, at a cost of 18 cents to 35 cents worth of current, depending on the price paid for electric power. In a full eight hour day, one operator with the electric hoist will handle 480 tons of material against 32 tons as a maximum that can be handled at the same time by two operators with the best hand hoist.

The capacity of the hoist, which has been demonstrated beyond question in many of our largest works, makes it of special value in textile mills for handling material in warehouses and in different parts of the mills. This method of transporting material will be found especially useful in finishing rooms, dyehouses, print works, etc. The current is

conveyed to the hoist by wire supported on the trolley frame. This enables the hoist with its load to be carried to any part of the



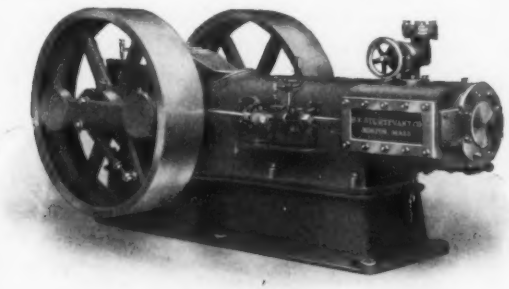
THE YALE & TOWNE ELECTRIC HOIST.

trolley system. Further information can be obtained upon application to the manufacturers.

The four largest cotton manufacturing countries of Continental Europe are in their order: Germany, Russia, France, Austria.

A STURTEVANT HORIZONTAL ENGINE.

The horizontal centre crank engine shown in the accompanying illustration is built by the B. F. Sturtevant Co., and specially designed for driving direct connected generators. Modifications, however, ensure successful operation as an independent engine. The ample bearing surfaces, abundant lubrication, and light but strong parts, make it possible to run the engine at a very high speed, which is closely regulated by an automatic governor. Continuous operation for weeks at a time with but little supervision and a minimum loss from friction are secured by



A HORIZONTAL CENTER CRANK ENGINE.

completely incasing the accurately finished parts and providing a system of lubrication that positively and continuously supplies the bearings with oil under pressure. An oil pump operated by the crank shaft draws oil from the reservoir and forces it through pipes and internal passages in the moving parts to the main bearings, the crank pin, crosshead pin and guides, valve slide, and eccentric. The pressure of about 15 pounds per square inch maintains a thin film of lubricant between these metal surfaces, and by preventing contact greatly reduces friction and wear and ensures a mechanical efficiency considerably over 90 per cent. The forced lubrication and complete enclosing of the parts result in a clean, durable, and economical steam engine.

The particular quality of silk made in Japan in the peasant's houses is made nowhere else. It is a low thin silk used very largely now for printing, for underwear and for women's blouses. It is very cheap and similar to European silk.

Dyeing, Bleaching, Printing, Etc.

FASTNESS OF COLORS.

There is no dye that is fast in the absolute sense, among either natural or artificial products. The colors of flowers, the inimitable beauty of which is so often admired, include some shades never yet produced by the chemist, but these are only fast during a certain part of the life of the plant. They serve their purpose and disappear. Hence it is unreasonable to make over-severe demands upon an artificial dye, and yet we find that some people expect a dye to be fast to air, light, washing, sweat, milling, ironing, wear, rubbing, lime and potting, and tests are often applied that are so rigorous that they destroy fabric and dye together.

The fastest colors, even now, are substances that occur in nature, some of which, however, are now made artificially. There are, nevertheless, many dyes, entirely artificial, which are fast enough for all practical purposes, and in many cases complaints of want of fastness are the result of the employment of unreasonable tests. Take, for example, testing for fastness to washing. One person will test by soaking in cold water, another by soaking in lukewarm water, another with boiling water. Others test with hot soap solution, or with hot soap and soda. If any article is boiled for hours in strong lyes, especially if bleaching powder is used, no dye will resist perfectly. The writer has known expensive silk embroidery so handled in the wash that it looked more like jute than silk. It smelt of acetic acid, and was absolutely guiltless of any lustre, while the feel was greasy and sticky. The dyes had run, and, as an object lesson in bad practice, the article left very little to be desired.

Bleeding is often caused by leaving the goods lying in the soap bath instead of washing and rinsing as quickly as possible. It may be safely said that 95 per cent. of the cases of bleeding in the wash are the fault of the laundry. It is impossible, in the vast majority of cases, to avoid bleeding entirely, but the important thing is to prevent the dye removed from fixing itself in the wrong place. To secure this object the soap bath must not be taken too hot or too strong. One pound of soap to fifty gallons of water at a temperature of from 60 degrees to 75 degrees C., gives a bath sufficiently powerful for any purpose, and if an article, when quickly washed in this and at once rinsed in lukewarm water, shows no change in its colors, the dye may be described as fast to washing. Many complaints are the result of careless rinsing. If any soap is left in the goods, the subsequent processes, ironing especially, are sure to cause stains. The test above is quite severe enough. A dye that will stand it, and yet will not stand the ordeal of the laundry has been improperly used there. Tests of other kinds of fastness must also be carried out with moderation.—Berlin Faerber Zeitung.

MULTICOLORED DYE EFFECTS ON WOOLEN FABRICS.

A process of treating wool in the raw state, and then mixing treated and untreated material, to be manufactured and subsequently dyed in the form of yarn or piece goods for the production of mixed effects, has recently been patented and is described as follows:

If wool is treated with tanning substances and metallic salts, its properties when dyed are totally changed. It can no longer be dyed with dyestuffs usually employed in dyeing, as it has acquired the property of combining with basic dyestuffs. The inventor states he has found that these properties may be applied to obtain bi- and multicolored effects with woolen piece goods and yarns.

If wool or similar animal fibres, treated with tanning substances and metallic salts, are spun or woven together with ordinary wool, goods are obtained which may be dyed in mixed effects of a totally different aspect, as the several parts of these goods exhibit a different behavior toward the dyestuffs. The wool treated with tanning substances and metallic salts readily absorbs basic dyestuffs,

but does not combine with the ordinary dyestuffs for wool, especially with acid dyestuffs, which, as is known, are much used in wool dyeing. The ordinary wool, however, worked up in yarns and piece goods does not absorb the basic dyestuffs in the presence of treated wool but readily combines with acid, chrome-developing, and mordant dyestuffs.

In finally dyeing three methods may be employed—first, only the treated wool is dyed with basic dyestuffs, whereas the untreated wool remains undyed; second, only the untreated wool is dyed with acid or chrome-developing dyestuffs and the treated wool remains undyed; third, the treated wool is dyed with basic dyestuffs, the untreated wool, however, with acid or chrome-developing dyestuffs.

Besides, wool dyed with fast dyestuffs may also be treated with tanning substances and metallic salts, to be then worked with ordinary wool into yarns and piece goods. If these goods are dyed with acid dyestuffs, only the ordinary wool absorbs the dyestuffs and not the wool previously dyed and treated with tanning substances and metallic salts. In this manner the most varied multicolored effects may be obtained. Besides sheep's wool other hair of animals—such as of goats, calves, cows, camels, horses, cats, hares, rabbits, etc., treating with tanning substances and metallic salts—may be worked in the same manner with untreated fibres, to be finally dyed in different ways, as described.

Wool may be worked up in any state of condition, as loose material, slubbings, yarn, and thread. On finally dyeing melange, thread, warp, weft effects or combinations thereof are obtained, according to the material employed. Besides, the tanning preparation may be also applied on slubbings, yarns, and pieces by way of printing. On finally dyeing these goods the effects come out as bi- or multi-colored printing designs.

The process may profitably be applied to all branches of the wool industry in the manufacture of carded yarn and slubbings, felts, hats, ladies' and gentlemen's cloths of all kinds.

On finally dyeing the goods the effects are rendered prominent by observing the following directions: The dyeing of the treated wool is done with basic dyestuffs, preferably at boiling-point, in a bath acidified with about ten per cent. of acetic acid fifty per cent. The best results are obtained by using azines, oxazines, and thiazines, also auramin and acridin-red, whereas the triphenylmethane dyestuffs produce less good effects, as they also dye the untreated wool. The more the reaction of the dye-bath is sour the purer are the effects. The dyeing of the untreated wool, however, occurs in a bath made up with Glauber's salt and acetic acid at 80 to 85 deg. centigrade. Here the effects come out more prominently if the bath is not too sour, a considerable quantity of Glauber's salt being added and the temperature not surpassing 75 deg. centigrade. Of the dyestuffs to be considered most of the acid and azo dyestuffs may be employed, but those containing only one sulfo group, especially in the presence of strong basic groups, are not advantageous for obtaining strong color contrasts, as they also dye proportionately the treated wool. To obtain specially pure effects and contrasts of colors, it is advisable to use the higher sulfonated acid and azo dyestuffs, as they only slightly dye the treated wool. The presence of strong acids in the bath influences the beauty of the effects.

STANDING BATHS IN WOOL DYEING.

Unexhausted dyebaths are in most cases kept standing for the sake of economy, but there are cases when the standing bath gives a fuller and more uniform shade than a freshly-made bath.

In cotton dyeing, and to some extent in silk dyeing, the saving of dye and mordant is the chief consideration, for it is usually impossible to exhaust the bath. Then, of course, it is advisable to reinforce to avoid waste of what still remains in the old bath. Even in wool dyeing, where it is generally essential to exhaust the bath completely, the bath may be kept standing in certain cases to save the fuel that would be required to heat up a fresh bath, as the old bath can be fed while still hot. This cannot be done with dyes that level badly, as the bath must be

made nearly cold before fresh quantities of such dyes are added.

In feeding acid baths, fresh acid should not be added until the bath is again at the boil; that is to say, until the acid still remaining in the bath is exhausted.

The baths should be kept standing when adjective dyes are being used, because these dyes usually require long boiling, and the use of two baths. Hence it is of especial importance to save dye, mordant, and fuel, as far as practicable. In the use of a chrome mordant the amount of chromium salt necessary for reinforcing the mordant bath depends largely on the reducing agent used. For instance, if this is tartar or oxalic acid, much bichromate remains unreduced, and as little as one-third of the original quantity often suffices to reinforce the bath. With lactic acid or lactolin more bichromate is needed, and if formic acid has been employed as a reducing agent as much bichromate as was added to the bath in the first instance must be used.

The standing bath may be employed with after-chromed colors. Here there are two cases to consider. Either the dyebath and the chroming-bath are separate, and are reinforced separately, or the after-chroming is done in the dyebath itself. The second method, although evidently far more economical, has nevertheless its own special disadvantages. Acid and chrome always remain in solution at the finish, and their presence prevents fresh use of the same bath, while it is still hot, except with dyes of great leveling power. Otherwise, the bath must be neutralized and cooled, before dyeing operations can be resumed with it.

To prevent the residual chrome spoiling the dyeing, the goods must be entered and boiled until they have taken up all the chromium still in solution. Then, and not before, can the bath be reinforced with dye, but it must be cooled to about 75 deg. C. before the fresh dye is added. As already hinted, dyes with great leveling power can be used without any of these precautions.—Das Deutsche Wollen-Gewerbe.

The world's production of wool is estimated to be 2,700 million pounds annually.

PADDING SULPHUR DYES.

Dyeing with sulphur dyes and with substantive dyes are closely analogous operations, and this fact has naturally incited attempts to pad with the sulphur dyes, especially as they are so fast. Many difficulties, however, are met with. Dyes to be used for padding must be very freely soluble, and in this respect the sulphur dyes are most unsuitable. Again, the use of copper or brass must be avoided in the padding machine. Another difficulty is the comparatively limited choice of hues afforded by the sulphur dyes, and by the fact that they require as a class more skill and experience to use them than the ordinary substantive dyes.

The result is that padding with sulphur dyes is resorted to, in spite of their fastness, in special cases only. Their province includes fast unicolored goods, and such calico prints where padding is resorted to in a second printing, especially for discharge patterns. In consequence of the great affinity of the sulphur dyes for vegetable fibre they will not only give fast colors in a cold bath but the short passage through the dye in the padding trough binds the color as much as the boiling dyebath. The fastness of the padded color is as good, with proper work, as that of direct-cotton colors.

Just as padding is better than dyeing with the substantive colors, so it is with the sulphur dyes. Less time and labor are required for a given output. Padding with the sulphur dyes is still in its infancy, but is becoming every day more and more common, especially for light and medium shades. No special machinery is required. An ordinary machine is used, except that no copper or brass must enter into its construction, as the sulphur will then injure both the machine and the goods. The padded goods pass direct into the rinse from the wringing rolls, and are then washed full width, if no oxidation is needed, i. e., for yellow, brown, green, orange, mode, and pale or medium blue. If air-oxidization is necessary the goods pass very slowly through the padding trough, are heavily wrung and then exposed full width to the air for from five to ten minutes on their way to the rinse. Rinsing jets should

be avoided with the sulphur dyes.

The padding bath is made by dissolving the dye in boiling solution of sodium sulphide, and then mixing with the usual salts previously dissolved. The solution is filtered through a cloth into a cask standing near the padding machine, and then diluted with the proper strength. To enable it to penetrate and to equalize better, the padding liquid is mixed with such substances as dextrine, Turkey-red oil, glycerine, or glucose, etc. While the goods are passing through the trough, the level of the liquid in it must remain constant, so it must be continuously replenished. In conclusion it may be mentioned that most dye-makers now make sulphur dyes especially for use by padding.—Farber Zeitung.

CARBONIZING WITH HYDROCHLORIC ACID.

This, the so-called dry process, is generally restricted to loose wool, wool rags, and cuttings. According to Gastemann's method the wool is dried, and then treated in a rotating cylinder heated to from 120 to 130 deg. C., by a steam coil. A pump is provided by which any damp air is extracted from the cylinder before the hydrochloric acid is let into it. When the acid has acted long enough it is pumped out but the heat and rotation are kept up for two hours afterwards. In the Gonster process the acid gas is used cold for one hour. Preusch and Emonds employ an apparatus in which the wool to be carbonized is dried on a sort of trellis-work by a stream of hot air. The air is then cut off, and the vapor from the boiling solution of the hydrochloric acid is admitted to the wool. When its action has lasted a sufficient time the acid is cut off and the hot air is turned on again until the carbonizing chamber is free from the fumes. The chamber is lined with lead. In Miarston's process the goods are exposed to a heated current of a mixture of hydrochloric acid gas and air. Schirp boils hydrochloric acid in a cast iron retort which rotates with the carbonizing drum containing the wool. The gas passes into the drum through the hollow axle common to the drum and the retort. The necessary preliminary drying of the wool is effected in the drum before the acid is admitted to it by means of a current of hot air. Both during this process and during the carbonization the wool is being continually lifted and let fall by projections on the inside of the drum.—The Deutsche Faerber Zeitung.

NOTES ON BICHROMATES.

BY H. HIELD.

(In Dyer and Calico Printer.)

In the dyeing of wool and woolen fabrics the bichromates of potash and soda are the principal mordants used, and the appearance of their bright orange crystals is familiar to all connected with the dyeing trade. The raw material used for making the bichromates is chrome ironstone. This is a brownish black, heavy ore, found in Hungary, Siberia, and North America. Chromium is also found in combination with lead and copper, but the iron ore forms the chief supply. In the manufacture of bichromates, a quantity of the finely powdered ore is mixed with potassium carbonate and lime, and heated for some time in a reverberatory furnace. The lime is added simply to prevent the mass from fusing, in which case the heavy ore would sink to the bottom, and the reaction would be much delayed. The roasting produces a mixture of chromate of potash, calcium chromate, and iron oxide, and carbonic acid gas is given off. To this mass water is added, and the sulphate of potash, which decomposes the calcium chromate to calcium sulphate and chromate of potash. The whole is then allowed to stand and settle, and to the clear liquor sulphuric acid is added. This converts the chromate of potash into sulphate of potash and bichromate of potash, which latter separates out, and is purified by further crystallization.

Bicromates of potash and soda contain no water of crystallization, and the standard brands on the market may be said to be chemically pure. The soda salt is rather deliquescent, but the potash salt is free from this fault. They melt below a red heat and crystallize again on cooling. At a high temperature they decompose, giving off oxygen

and forming a mixture of the chromate and sesquioxide. The solubility of the potash salt is as follows: At 0 deg. 100 parts of water dissolve 4.6 parts of the salt; at 10 deg. 7.4; at 20 deg. 12.4 parts; and at 100 deg. 94.1 parts. A saturated solution of the salt boils at about 104 deg. C.

The action of bichromates upon the body depends almost entirely upon the constitution of the individual; some persons are seemingly quite immune to chromium, while others are attacked directly. Of course, taken internally, it is a strong poison with a marked corrosive action. The dust arising from packing or weighing bichromates attacks the mucous membranes of some persons very quickly, causing all the symptoms of a severe cold in the head; others can work among it without showing any discomfort. The same applies to the sores occasionally found upon the hands of workers in chrome, but it appears to require to come in contact with either an abrasion or the mucous surfaces to have any bad effects. It is as mordants for wool goods that chrome salts find their chief use, although they are used to some extent for oxidizing in the process of dyeing black with aniline salts.

In mordanting with chrome the percentage required is from 1 1/2 to 4 for every 100 lbs. of wool, light colors taking 1 1/2 to 2 1/2 per cent., and darker ones up to 4 per cent. Along with the bichromate it is usual to add either sulphuric, lactic, or oxalic acid to aid in depositing the chrome on the fibres and ensure it going on level. Tartar, used in conjunction with bichrome, gives the best results, both for brightness and level dyeing, but the cost is a serious drawback. Sulphuric acid helps in depositing the mordant, but not so effectively as lactic; in fact, this latter acid is inclined to work rather too fast, if used alone. During the mordanting of woolens the chrome salts pass through a number of stages, ranging from the higher and very unstable oxides down to the sesquioxide, which is the most permanent. After the process is complete, the precipitated chromium on the cloth is usually of a dull yellow or buff color; in other cases the hue is inclined to a greenish yellow, but at all times it gives a clue to the stage of oxidation the chrome is in. If the boiling has been too short, the color of the mordanted fabric will be a brighter yellow, showing the presence of the higher oxides, while the nearer the color is to a grey green the more are the oxides brought down towards the state of sesquioxide, which is the most stable of all.

The higher forms of chromic oxides are extremely sensitive to light, and bright sunshine falling on a mordanted fabric will cause a darkening wherever the rays fall. The degree of sensitivity to light appears to depend upon the amount of unreduced mordant present. The lower the reduction the less sensitive is the mordant; and the lowest stage of all, that of sesquioxide or chromic oxide (Cr_2O_3), appears to be unaffected altogether. The state in which the oxides of chromium are after mordanting very much influences the taking up of coloring matter during dyeing. It appears necessary for a certain percentage of higher oxides to be present in order to exert an oxidizing action upon the dye itself. Particularly is this the case with the dyewoods or any coloring matter existing primarily as a glucoside, and at the same time the color is oxidized it combines with the chromium at the expense of the latter's oxygen and becomes fixed to the fibres.

It is very probable that, long after dyeing, bichromate mordants undergo a gradual slow reduction that may take months or years, according to the conditions the fabric has to undergo. Moisture, together with sunlight, has a very powerful action in effecting a change in the mordant, and this would account for the color fading under the influence of these conditions. The most severe test for dye and mordant to undergo is the combined action of sea water and hot sunshine, the two together bringing about chemical decomposition very rapidly. From sea water chlorine would be set free, and this alone, without counting the presence of both iodine and bromine, is sufficient cause for its destructive action upon colors.

As mentioned previously, fabrics mordanted with either of the bichromates are very susceptible to light. For this reason it is imperative that mordanted goods be washed off immediately they leave the vessel; by doing this the unreduced chrome in

the liquor is got rid of, which is the factor likely to cause sun stains. It is a very simple matter to allow a coach full of chromed cloth to stand a few minutes previous to entering the washing machine, and if the goods are shielded from direct sunlight probably no harm will result. But let them be exposed for even, say, 60 seconds under a hot sun, and the cloth will be stained wherever the rays fell. Bichromates of potash and soda have also other little peculiarities; for instance, their property of combining with size or gelatine to form an insoluble body of a leathery consistency. This feature is taken advantage of in the tanning or curing of hides. The affinity of bichromates for size may also be the cause of stains or uneven dye occurring in woolen and worsted cloths, as this latter is often used to strengthen the warps during weaving. Of course, if properly scoured before mordanting, there will be no risk of size being left in, but so many cloths are now dyed without any preliminary scouring that this danger has to be reckoned with. Scouring is omitted from the treatment of many cloths, not from any motive of economy, but simply because the fabric is better without it and finishes with a softer and more elastic handle. Bichromates will also thicken and oxidize many of the vegetable oils; and here, again, this increases the danger of staining.

It is well known how quickly salts of lead will unite with chromium to form the yellow chromate of lead. For this reason exposed pipes or tanks made of lead are likely to contaminate mordanted cloth if the two come into contact. Lead exposed to atmospheric moisture and gases soon forms soluble lead salts, and these are quickly acted upon by chromic acid.

If used in the proportion of 1 to 6 per cent. on the weight of cloth, bichromates supply a mordant with a powerful affinity for coloring matters; exceed this limit and they act as a stripping agent. Over-chromed cloth is well known to dye up a thin, hungry shade, and this is due to the destructive oxidizing action the bichromates exert on the dye when present in quantity. Previous to the advent of chrome mordants, all blacks on wool were mordanted with copperas. This gave a cleaner and faster black than chrome, but the shade was limited to dead black only. As things are now, blue blacks are required for nearly all classes of goods, and a dead jet black is seldom asked for. By using bichromates as mordants any gradation black can be obtained, with the advantage of possessing a rich bloom when seen against the light. Old and faded garments always show the groundwork of the mordant up with time, blacks dyed with iron turning to a rusty brown, the color of the oxide, while chrome-prepared goods show the characteristic color of the green sesquioxide of chrome.

In order to free cloths from any residue of chromic acid, the passage through a cold bath of bisulphite of soda is recommended. This would certainly reduce the chrome present, but it is doubtful if the dye would have the same affinity for the mordant after this treatment. From some of the experiments tried by the writer it appears essential that some of the chrome should be present on the mordanted fabric in the form of the dioxide, the sesquioxide having very little fixing power if alone. A case in point bearing on this question was where some rags had been mordanted with bichromate of potash and hydrochloric acid as an assistant. When the dyeing was attempted it was found that none of the dyes (wool colors) would go on. In this example the chrome on the material would, of course, be in the green chromic oxide state. As a discharge for vat-dyed indigo, the bichromates, together with sulphuric acid, are well known. The same combination is also much used for stripping down dyed rags which are wanted for other colors. In the dyeing of aniline black, baths of the bichromates play an important part in finally oxidizing the dark green cotton after dyeing, and the development of the chromotrope colors also depends upon the action of chromic acid after dyeing.

New Color Cards.

Crystal Violet 10 B; Cassella Color Co., New York City.

Two samples of cotton yarn and two of cotton piece goods showing one and two per cent. dyeings with Crystal Violet 10 B. There are also two samples of printed cotton, one printed direct and the other in the tannin discharge style.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 81.

Red on Worsted Yarn.

Chrome Fast Red B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Fast Red B.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter yarn at 140° F., raise to a boil and after boiling 3/4 of an hour add

4 lbs. Sodium Bisulphate

and boil 1/2 hour longer to exhaust the dye bath.

Chrome Fast Red B, when dyed directly, gives a bright, full shade of red which, when after-treated with potassium bichromate and acetic acid, is somewhat dulled in shade but rendered faster.

For sample of after-chromed color, see Recipe No. 82.

Recipe No. 82.

Red on Worsted Yarn.

Chrome Fast Red B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Fast Red B.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter yarn at 140° F., raise to a boil and after boiling for 3/4 of an hour add

4 lbs. Sodium Bisulphate

and boil 1/2 hour longer to exhaust the dye bath.

Then after-treat in a fresh bath containing

1½ lbs. Potassium Bichromate,
3 lbs. Acetic Acid,

for 1/2 hour.

Chrome Fast Red B, when after-treated in this way, is rendered faster to light, washing and fulling.

For direct dyeing see Recipe No. 81.

Recipe No. 83.

Blue on Worsted Yarn.

Anthracene Acid Blue R R on 100 lbs. worsted yarn. First mordant the yarn by boiling 1 1/2 hours with

3 lbs. Potassium Bichromate.
2 lbs. Tartar.

Rinse and dye in a fresh bath containing

2 lbs. Anthracene Acid Blue R R.
(Cassella Color Co., 182 Front St., New York.)
2 lbs. Acetic Acid.

Enter the yarn at 50° C., raise to a boil in 1/2 to 3/4 of an hour and boil 1 to 1 1/2 hours. Then add a little further acetic acid, if necessary, to exhaust the dye bath.

Anthracene Acid Blue R R possesses excellent fastness to washing, fulling, alkalies and steaming. The fastness to light is also very good.

The dyeings produced are very bright and it will be found valuable in the production of compound shades, particularly in connection with mordant colors.

Recipe No. 84.

Pink on Bleached Cotton Yarn.

Chlorantine Pink on 100 lbs. bleached cotton yarn. Prepare the dye bath with

¼ lb. Chlorantine Pink.
(A. Klipstein & Co., 122 Pearl St., New York.)
25 lbs. Glauber's Salt.

Enter yarn at 180° F., bring to a boil and dye at a boil for one hour.

Chlorantine Pink produces a clear shade of pink which is neither too blue nor too yellow in character, and for this reason will be found excellent for the production of straight pinks.

Recipe No. 85.

Sulphur Blue on Cotton Yarn.

Thiogene Cyanine O on 100 lbs. cotton yarn. Prepare the dye bath with

First Bath.

6 lbs. Thiogene Cyanine O.
(H. A. Metz & Co., 122 Hudson St., New York.)
9 lbs. Sodium Sulphide (Cryst.).
4 lbs. Soda Ash.
25 lbs. Common Salt.

Second Bath.

4 lbs. Thiogene Cyanine O.
(H. A. Metz & Co., 122 Hudson St., New York.)
6 lbs. Sodium Sulphide (Cryst.).
1 lb. Soda Ash.
5 lbs. Common Salt.

Dye one hour just below a boil. Squeeze quickly and thoroughly wash.

Thiogene Cyanine O is characterized by being a Sulphur Blue which dyes evenly without any special after-treatment.

It possesses excellent fastness to light and chlorine and is well suited for the dyeing of all classes of cotton goods.

Recipe No. 86.

Blue on Worsted Yarn.

Domingo Alizarine Blue N on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Domingo Alizarine Blue N.
(C. Bischoff & Co., 88 Park Pl., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 140° F. and dye at a boil until the dye bath is exhausted.

After cooling the dye bath somewhat add

2 lbs. Potassium Bichromate

and after-treat at a boil for 1/2 hour.

Domingo Alizarine Blue N gives a good shade of blue which possesses excellent fastness.

Recipe No. 87.

Blue on Woolen Cloth.

Acid Blue C Y on 100 lbs. woolen cloth. Prepare the dye bath with

2 lbs. Acid Blue C Y.
(American Dyewood Co., 156 William St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter into the dye bath at 120° F., bring slowly to a boil and dye at a boil for one hour.

Acid Blue C Y dyes very level and possesses good fastness to light, washing and milling.

Recipe No. 88.

Lilac on Bleached Cotton Yarn.

Chlorantine Lilac B B on 100 lbs. cotton yarn. Prepare the dye bath with

¼ lb. Chlorantine Lilac B B.
(A. Klipstein & Co., 122 Pearl St., New York.)
25 lbs. Glauber's Salt.

Enter yarn at 180° F. and dye at a boil for one hour.

Chlorantine Lilac B B possesses even dyeing qualities and produces a very clear color upon the fibre.

Recipe No. 89.

Blue on Worsted Yarn.

Anthracene Acid Blue G G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Anthracene Acid Blue G G.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt.
2 lbs. Acetic Acid.

Enter yarn at 120° F., raise to a boil during 1/2 hour. Dye at a boil 1/2 hour and then exhaust the dye bath by gradually adding.

3 lbs. Sulphuric Acid.

Cool the bath a little and add

2 lbs. Potassium Bichromate

and boil 3/4 of an hour longer.

Anthracene Acid Blue G G possesses excellent fastness to washing, fulling, alkalies and steaming. The fastness to light is also very good.

The dyeings produced are very bright and it will be found valuable in the production of compound shades, particularly in connection with the mordant colors.

Recipe No. 90.

Blue on Worsted Yarn.

Anthracene Acid Blue G G on 100 lbs. worsted yarn. First mordant the yarn by boiling 1 1/2 hours with

3 lbs. Potassium Bichromate.
2 lbs. Tartar.

Rinse and dye in a fresh bath containing

3 lbs. Anthracene Acid Blue G G.
(Cassella Color Co., 182 Front St., New York.)
2 lbs. Acetic Acid.

Enter the yarn at 50° C., raise to a boil in 1/2 to 3/4 of an hour and boil 1 to 1 1/2 hours. Then add a little further acetic acid, if necessary, to exhaust the dye bath.

Anthracene Acid Blue G G possesses excellent fastness to washing, fulling, alkalies and steaming. The fastness to light is also very good.

The dyeings produced are very bright and it will be found valuable in the production of compound shades, particularly in connection with mordant colors.

Recipe No. 91.

Red on Worsted Yarn.

Chrome Fast Red G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Fast Red G.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter yarn at 140° F., raise to a boil and after boiling 3/4 of an hour add

4 lbs. Sodium Bisulphate

and boil 1/2 hour longer to exhaust the dye bath.

Chrome Fast Red G, when dyed directly, gives a bright, full shade of red which, when after-treated with potassium bichromate and acetic acid, is somewhat dulled in shade but rendered faster.

For sample of after-chromed color, see Recipe No. 92.

Recipe No. 92.

Red on Worsted Yarn.

Chrome Fast Red G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chrome Fast Red G.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Acetic Acid.

Enter yarn at 140° F., raise to a boil and after boiling for 3/4 of an hour add

4 lbs. Sodium Bisulphate

and boil 1/2 hour longer to exhaust the dye bath.

Then after-treat in a fresh bath containing

1½ lbs. Potassium Bichromate,
3 lbs. Acetic Acid,

for 1/2 hour.

Chrome Fast Red G, when after-treated in this way, is rendered faster to light, washing and fulling.

For direct dyeing, see Recipe No. 91.

Recipe No. 93.

Dark Lilac on Bleached Cotton Yarn.

Tetrazo Lilac R R Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

1 lb. Tetrazo Lilac R R Conc.
(American Dyewood Co., 156 William St., New York.)
25 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Tetrazo Lilac R R Concentrated possesses very good fastness to light for a color of this class.

Recipe No. 94.

Brown on Worsted Yarn.

Acid Anthracene Brown R H Extra on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Acid Anthracene Brown R H Extra.
(Continental Color & Chemical Co., 128 Duane St., New York.)
3 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter yarn at 140° F., bring slowly to a boil and dye at a boil 30 to 40 minutes.

When the bath is exhausted after-treat with

1½ lbs. Potassium Bichromate

for 1/2 hour.

Acid Anthracene Brown R H Extra possesses very good fastness to all the common color destroying agencies.

Recipe No. 95.

Green on Cotton Yarn.

Thiogene Green G L Extra on 100 lbs. cotton yarn. Prepare the dye bath with

First Bath.

14 lbs. Thiogene Green G L Ex.
(H. A. Metz & Co., 122 Hudson St., New York.)
14 lbs. Sodium Sulphide (Cryst.).
5 lbs. Soda Ash.
30 lbs. Common Salt.

Second Bath.

10 lbs. Thiogene Green G L Ex.
(H. A. Metz & Co., 122 Hudson St., New York.)
10 lbs. Sodium Sulphide (Cryst.).
3 lbs. Soda Ash.
10 lbs. Common Salt.

Third Bath.

8 lbs. Thiogene Green G L Ex.
(H. A. Metz & Co., 122 Hudson St., New York.)
8 lbs. Sodium Sulphide (Cryst.).
1½ lbs. Soda Ash.
5 lbs. Common Salt.

Dye for one hour just below the boil. Squeeze quickly and wash immediately.

Thiogene Green G L Extra gives very clear and bright shades possessing excellent fastness to light and stoving.

Its solubility is excellent and it is therefore well suited for dyeing all classes of cotton goods, either in vats or in machines.

Recipe No. 96.

Navy Blue on Worsted Yarn.

Victoria Navy Blue D K on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Victoria Navy Blue D K.
(Continental Color & Chemical Co., 128 Duane St., New York.)
10 lbs. Glauber's Salt (Cryst.).
5 lbs. Sulphuric Acid.

Enter yarn at 140° F., bring slowly to a boil and dye at a boil for about one hour.

Victoria Navy Blue D K dyes easily level and can be employed for the production of cheap, bloomy navy blues. It possesses good fastness to steaming and for this reason may be used for the dyeing of ladies' dress material and cheap suitings.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

Georgia, Dalton. The Elk Cotton Mills have been incorporated with capital stock of $200,000, for purpose of spinning yarns. Work will start at once on erection of new plant, to be equipped with 10,000 spindles.

*Massachusetts, New Bedford. Work is being pushed on the new Taber Mill and it is fully expected to have the looms in operation by October.

*Massachusetts, New Bedford. Plans have been completed for the new buildings to be built for the Taber Mill. The main building will be 400 by 279 feet, one story, with wings, one and two stories, 112 by 136 feet, to contain boiler house, engine room, warehouse and cloth room.

*North Carolina, Charlotte. J. L. Mayes, L. A. Dodsworth and C. L. McClain are interested in the Mayes Manufacturing Co. recently incorporated with capital stock of $100,000. The company proposes manufacturing 40 and 60 combed yarn and expects to be in operation by Jan. 1st, 1907. Plant will be equipped with 10,000 spindles to be eventually increased to 25,000.

*North Carolina, Charlotte. J. H. Mayes is president of the Mayes Manufacturing Co., recently incorporated with capital stock of $100,000; L. A. Dodsworth (Charlotte), secretary and treasurer and T. E. Moore, Tucapau, vice president. They propose building a mill with installation of 10,000 spindles at first, gradually increasing to 25,000. Work will start at once on plans and specifications.

*North Carolina, Fayetteville. H. W. Lilly is president of the Victory Mfg. Co., recently reported incorporated with capital stock of $225,000; Adam Caterall, New York, vice president, and F. M. Cook, secretary and treasurer. This plant is to be operated by electricity.

*North Carolina, Fayetteville. The Victory Manufacturing Company has been incorporated with capital stock of $200,000, of which $175,000 has already been subscribed. A plant is proposed for manufacturing print cloths. Frank McKnight and Fletcher Cook are interested.

*North Carolina, Greensboro. Operations have begun in the spinning department of the Pomona Manufacturing Co.'s new plant. This company will start operations with equipment of 10,751 spindles and 330 looms.

*North Carolina, Lumberton. N. A. McLean is president of the National Cotton Mills, which have been incorporated recently with capital stock of $200,000; Geo. B. McLeod, vice president; A. P. McAllister, secretary and treasurer and J. W. Kaneer, superintendent. The Board of Directors will at once determine size of buildings, equipment, etc.

*Rhode Island, Enfield. Contract has been awarded for the new mill to be erected here by a syndicate in which Clarence Whitman & Co., of New York, are interested. They will also utilize the old mill building purchased from Wm. J. Dunn. The new building will be 300 by 125 feet, with separate engine and boiler house. It is reported that a special class of goods, mostly fancies, will be made and that about 50,000 spindles will be operated.

*South Carolina, Greenville. The Vardry Cotton Mills, incorporated with capital stock of $75,000, have secured a building which they are remodeling and equipping with necessary machinery. They expect to begin operations in about 90 days, making high grade, black, white and blends, 20s to 30s two ply warps, with 5,000 spindles. A dye house will be attached to the plant, operated by steam and water. L. M. McBee is president and treasurer of the company and J. W. Roberts, superintendent.

*South Carolina, Pickens. Work will begin about July 1st on construction of the new buildings for the Pickens Mill, recently reported incorporated with capital stock of $250,000. W. M. Haygood will be president and treasurer of the concern. They will make 36 in. 48 by 52 cloths, operating 15,000 ring spindles and 500 looms. Steam will be power used.

*South Carolina, Rock Hill. Alexander Long will be president and treasurer of the Aragon Cotton Mills, recently incorporated with capital stock of $350,000. Plans and details are being prepared for a building with equipment of 20,000 spindles and 600 looms, for manufacturing 4-yard sheeting.

Enlargements and Improvements.

Alabama, Lanett. The Lang Manufacturing Co. is adding a weave room and picker department to the No. 2 mill at this place.

*Connecticut, South Norwalk. Herman Haehnel, who is building an addition to his lace mill, is to add five or six new machines when addition is completed. Mr. Haehnel was formerly with the Boese, Peppard Co.

Delaware, Wilmington. Joseph Bancroft & Sons Co., cotton weavers, dyers and bleachers, have filed a certificate increasing their capital from $2,000,000 to $3,000,000. This is the largest concern of its kind in Delaware.

*Georgia, Cedartown. The Standard Cotton Mills will start work in October on addition to the plant and expects to have the additional machinery, 3,600 spindles, installed and in operation about Jan. 1.

Georgia, Forsyth. The Trio Manufacturing Co., now operating 3,000 spindles, proposes increasing to 10,000 spindles.

Georgia, Gainesville. The Gainesville Cotton

Mills are to install 2,000 additional spindles and 76 more looms in the plant. The machinery has been ordered.

Georgia, Lawrenceville. The Lawrenceville Manufacturing Co. contemplates installing 5,000 additional spindles in the plant.

Georgia, Monroe. The Walton Cotton Mill Company proposes increasing the present capacity of the plant.

Maryland, Elk Mills. The Baldwin Manufacturing Co. is to build a new weave shed 100 by 50 feet and will equip same with the latest improved machinery.

*Maryland, Elk Mills. The Baldwin Mfg. Co. will begin work in about ten weeks on erection of the new addition, 50 by 100 feet, to their mill. This concern now operates 48 broad looms on upholstery goods. It has not yet been definitely decided just how many additional looms will be added.

Massachusetts, Attleboro. Several new braiding machines are being installed in the Standard Braiding Company's mill.

Massachusetts, Bondsville. The Boston Duck Co. is to build a picker house, 120 by 50 feet, two stories, a new dye house, 198 by 60 feet, three stories, and a four-story addition to the cotton storage warehouse.

Massachusetts, Easthampton. The West Boylston Manufacturing Company has started work on erection of a new storehouse, 100 feet square, three stories high.

Massachusetts, Fall River. The Merchants Manufacturing Co. has ordered more revolving flat cards from the Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Massachusetts, Fall River. The Osborne Mills have recently installed twelve combers.

Massachusetts, Lawrence. An extension of one story is to be made to the No. 2 twisting mill of the Arlington Mills. The building is now two stories, 300 by 60 feet.

Massachusetts, Lowell. The Hamilton Mills are to install new Nasmith combers in the plant.

Massachusetts, Rockland. The Rockland Webbing Co. is installing six additional machines, which will give a total of 31. The plant will be increased gradually until there are 100 machines.

Mississippi, Winona. The Winona Cotton Mills are to add 4,000 more spindles and 100 looms to their equipment.

*New Hampshire, Dover. The Cocheco Manufacturing Co. is making extensive improvements to No. 1 mill. New cards are replacing the old ones.

*North Carolina, Bessemer City. Preparations are being made by the Bessemer City Cotton Mills for adding a finishing plant to their mill.

North Carolina, Charlotte. About $5,000 worth of new machinery is being installed in the Elizabeth Mills.

North Carolina, Cherryville. The Vivian Cotton Mills propose doubling the capacity of the plant.

North Carolina, Charlotte. The Dover Yarn Mills have increased the number of spindles from 8,500 to 14,000.

*North Carolina, Durham. The Golden Belt Manufacturing Co. will install 2,080 additional ring spindles and have purchased same. No new building will be required nor addition to power plant.

*North Carolina, Greensboro. The White Oak Cotton Mills are reported as installing the balance of the mills' machinery equipment, viz: 30,000 spindles and 1,000 looms. Only half of the company's equipment was installed at first.

North Carolina, Marshall. The Capitola Manufacturing Company is to add 4,000 more spindles in the plant.

North Carolina, Mt. Holly. The Mt. Holly Mills contemplate adding about 1,500 additional spindles in the plant.

North Carolina, Roanoke Rapids. The Rosemary Manufacturing Company is reported making arrangements to add 5,000 more spindles and 148 looms to the plant.

North Carolina, Roxboro. The Roxboro Cotton Mills Company is to erect a new mill with equipment of 10,000, for manufacturing warps.

*North Carolina, Shelby. The Shelby Cotton Mills have started work on erection of the new addition, and some 1,000 spindles will be added. This will give them a total of 8,500 ring spindles and 250 looms, on 5-yd. sheetings.

North Carolina, Spray. The Rhode Island Company is to add 4,000 spindles and 150 broad looms in the mill.

North Carolina, Statesville. The capacity of the Bloomfield Mfg. Co.'s plant is to be doubled.

*North Carolina, Worth. The Harden Mfg. Co. has started running the additional machinery installed in the plant. They now operate 4,160 ring and 2,000 twister spindles.

Pennsylvania, Chester. The Jordan Manufacturing Co. have increased their capital to $360,000, and have also made a change among their officers, which are as follows: William S. Blakeley, pres.; Richard Wetherell, treasurer, succeeding I. W. Jordan, and Alexander W. Meigs, sec. The mill, under the superintendency of Robert F. Kineavy, is run on fine cotton and silk fabrics operating 840 looms, the production being bleached, dyed and finished on the premises and sold direct from their office at 84 Leonard St., New York.

Pennsylvania, Norristown. The Wyoming Spinning Co., foot of Swede Street, who have been running 5,000 ring spindles on cotton yarns, have doubled their plant by an addition of 5,000 mule spindles, all of which they are running to their fullest capacity. The company has a capital of $60,000 with John T. Dyer as president and treasurer, and E. S. Adams, secretary and buyer. A dye house is also one of the adjuncts to the mill, and it too, like the other departments, is running full time.

Pennsylvania, Philadelphia. The Stanley Manufacturing Company, Adams and Church Sts., Frankford, of which Charles Stanley and William Smith are the proprietors, since their starting in

business about three years ago as winders, twisters, spoolers and coners of cotton, wool, worsted and silk yarns, have been compelled to take in another floor in the building where they are located in order that they might be able to double their plant. They have recently put in a new 500 spindle Foster winder and added 1,000 additional twisting spindles and also a department for quilling with 5 quilling machines and 6 dresser spoolers. They have enough work on hand to keep them running both day and night for some time to come.

Pennsylvania, Philadelphia. The Bennett & Aspden Co., who started their business of manufacturing plushes at Germantown Ave. and 10th St., have removed their business to the old Lincoln Mill on Main St., Manayunk, where they have in operation 8 looms and have installed a new and up-to-date plant for the finishing of these fabrics.

South Carolina, Anderson. The H. C. Townsend Cotton Mill is to be doubled. Present equipment comprises 2,280 ring spindles.

*South Carolina, Bamberg. We have been advised by the Bamberg Cotton Mills that their main plant was not injured in the recent fire, only the cloth room and office being burned. Operations have been resumed as usual in the main building. Work has been started rebuilding burned portion of the plant and it is expected that the entire plant will be in operation in about two weeks. The total loss is placed at $17,000, with insurance of $13,100.

South Carolina, Camden. At the recent meeting of the stockholders of the Hermitage Cotton Mills Company, it was recommended by H. C. Carrison, president of the company, that the plant be equipped to its full capacity, and that 3,000 new spindles will be put in.

*South Carolina, Camden. The Hermitage Cotton Mill will install 3,000 new spindles and 80 new looms in the plant. They now operate 12,000 ring spindles and 300 looms.

*South Carolina, Clinton. We have been advised by the Lydia Cotton Mills in regard to the contemplated enlargement, that they are equipped with end of the mill boarded up for the proposed addition, and will make same some time, not having definitely decided just when.

South Carolina, Clover. The Clover Cotton Mfg. Co., which recently decided on a 5,000 spindles extension to their present mill, have placed their order for revolving flat cards with the Howard & Bullough American Machine Co., Pawtucket, R. I.

*South Carolina, Enoree. The Enoree Manufacturing Company have completed installation of the additional machinery ordered some time ago. They now have a total equipment of 36,000 spindles and 960 looms.

South Carolina, Hamer. The Hamer Cotton Mills are to expend about $75,000 on additions to the plant, including 5,000 more spindles.

South Carolina, Irene. The Saxe Gotha Mills contemplate adding about 5,000 more spindles to their present equipment.

*South Carolina, Lockhart. Work has begun installing the machinery in the Lockhart Mills No. 2 mill. It is not known just when operations will begin, but it is hoped to have the plant running smoothly early in the new year.

*South Carolina, Newberry. The Mollohon Cotton Mills, previously reported to increase capital stock, will erect Mill No. 2 next year, increasing number of spindles to 43,000 and looms, 1,000, thereby adding 13,000 new spindles and 328 looms.

South Carolina, Ninety-Six. The Ninety-Six Cotton Mills are reported to enlarge the buildings and install additional machinery.

South Carolina, Rock Hill. The Victoria Cotton Mills are to start work at once installing 2,440 new spindles.

South Carolina, Rock Hill. The Highland Park Mfg. Co. has placed an order for 8,000 additional spindles to be installed in the plant during the summer.

South Carolina, Spartanburg. The Saco & Pettee Machine Shops, Newton Upper Falls, Mass., have received a repeat order from the Drayton Mills for roving and spinning machinery.

South Carolina, Spartanburg. The Beaumont Manufacturing Company located in this city has just completed extensive improvements. The company has added 5,000 spindles and the other machinery necessary for the manufacture of cotton yarns. A new building 70 by 220 feet and two stories high has been erected. Twines and carpet warps, sizes 6 to 8s, also print cloths and converters' goods are made. The officers of the company are as follows: J. H. Sloan, president; D. L. Jennings, secretary and treasurer and J. D. Lokey, superintendent.

*South Carolina, Williamston. The Williamston Mills, now equipped with 25,984 spindles and 600 looms, all in operation, will install, during the summer, 3,584 spindles and 100 additional looms, giving them a total of 29,568 spindles and 700 looms. This plant is run on 39"-68 by 72-4.75 cloths.

*Tennessee, Chattanooga. The Vance Cotton Mill Company is installing 4,000 additional spindles in the plant.

Texas, Denison. It is reported that W. B. Munson proposes enlarging the Denison Cotton Mills, now equipped with 15,000 spindles.

Virginia, Roanoke. The Roanoke Cotton Mills propose doubling the present capacity (6,000 spindles and 35 cards).

Mills Shutting Down.

New York, Pleasant Valley. The Pleasant Valley Cotton Mills have been shut down indefinitely.

WOOLEN.

New Mills.

*Massachusetts, Clinton. Operations have been started in the Litchfield Worsted Mills, W. J. Brodmerkle, proprietor.

*Massachusetts, West Millbury. The Millbury Worsted Co. has been organized by local business men to operate the Ramshorn Mill, making dress

goods. C. A. Root, F. P. Brady, A. A. Sprague and L. Bachmann are among those interested.

*New York, Camden. The Camden Woolen Mills, Henry W. Lindley, will start operations July 1st in the building formerly occupied by the Camden Textile Co. Will manufacture fine woolen blankets. They will operate 1 set cards and 5 looms, also dye house. Product will be sold through Converse, Stanton & Co., N. Y. The capacity of the plant will be increased later.

Ohio, Cincinnati. A new company has been organized as the Cincinnati Woolen Company and a plant will be established at Front Street and Park Avenue for making woolens.

*Rhode Island, Manville. The Manville Worsted Co. has started operations making worsteds, with equipment of 6 looms. August Dont is president of the company, A. Crepeau, treasurer, and L. L. Mailhot, acting secretary. Product is sold direct.

*Vermont, Ludlow. Contract has been let for the erection of the new buildings for the Jewell Brook Woolen Co. The main building will be two stories, with picker and dye house, 40 by 46 feet, two stories, and engine and boiler house, one story, 33 by 32 feet.

*Wisconsin, Luxembourg. The company being organized at this place is to be known as the Luxembourg Woolen Mill Co. They are investigating the question of a knitting mill to cost not over $20,000. They have not yet decided what line of goods they will make or the equipment.

Enlargements and Improvements.

Connecticut, Norwalk. The old Bishop Mill at this place has been bought by the Salt's Textile Company, of Bridgeport, Conn., and will be equipped with machinery to be operated as a branch plant.

*Connecticut, Stafford Springs. The Rhode Island Worsted Co. has purchased the Fox Village Mills at this place and after making necessary repairs will put the plant in operation. They will also erect a new weave shed later on.

Indiana, South Bend. The South Bend Woolen Company has recently increased the capital stock from $40,000 to $200,000.

Maine, Dexter. The Dumbarton Mills are to renovate and repair the spinning room of their plant and will increase facilities for business. Six new mules will be installed, replacing jacks.

*Maine, Dexter. Work has begun by the Wassookeag Woolen Company on the erection of their new three-story building.

Maine, Kezar Falls. The Kezar Falls Woolen Company is to erect a new building 35 by 60 feet, two stories, for offices, sample room and a loom for weaving samples.

Massachusetts, Lawrence. The Crescent Worsted Company has purchased a three-story brick mill at West Concord, N. H., where operations will be started in about a month, spinning worsted yarns.

Massachusetts, Lowell. An addition, 100 by 40 feet, one story, brick, to the finishing room, is under way for the Belvidere Woolen Mills.

Massachusetts, New Bedford. The Beacon Mfg. Co. is building an addition, 112 by 400 feet, one story high.

Massachusetts, Uxbridge. The Davis & Brown mill has been closed for the past week for the purpose of making needed repairs and installation of some new machinery.

Massachusetts, Worcester. The vacant buildings at Sargent and Gold Streets have been purchased by the Queensbury Mills. The buildings will be remodeled and equipped for manufacturing mohair and worsted yarns. It is expected that the new plant will be ready to start operations by October 1st.

*Minnesota, Minneapolis. The new building which the Northwestern Knitting Company proposes erecting will be 218 by 58 feet, six stories. It will be of reinforced concrete construction. They also propose erecting a new power house, 100 by 52 feet, one story, and will install an entirely new power plant. They do not propose installing any new machinery this year, but will start about next January putting in new machinery gradually.

Ohio, Ashtabula. The Ashtabula Worsted Mills are installing 30 new looms in the plant.

Pennsylvania, Bridgeport. James Lees & Sons Co., manufacturers of worsted and woolen yarns, have increased their plant and are now operating 17,000 worsted spindles, 45 worsted cards, 26 woolen cards and 28 combs. They are also putting up a stone addition to their wash room, 156 by 21 feet, which they expect to have completed within a short time. They have a capital of $800,000 and the following officers: C. F. Williams, president; W. L. Stauffer, vice-president and agent, and Fred Carter, superintendent. They are very busy.

Pennsylvania, Chester. The Chester Worsted Company, which recently put up a new addition to their plant, have increased their productive capacity by 500 spindles. They are manufacturers of worsted yarns for weaving and knitting and are operating 3,500 spindles. The company has a capital of $100,000 with the following officers: W. Seymour Runk, president and treasurer, and John W. Turner, secretary and superintendent. They are very busy.

Pennsylvania, Chester. James Irvington & Son's Irvington Woolen Mills, formerly run on jeans, tweeds and cassimeres, are now run on cassimeres only. The 75 narrow looms formerly operated on these goods have been replaced by 40 broad looms, all of which are running full time. The mill is run by both water and steam, and they also do their own dyeing and finishing.

*Pennsylvania, Darby. Work is under way on the new three-story building for Verlenden Bros. A new picker house and dye house will also be erected.

Pennsylvania, Philadelphia. The Freeland Manufacturing Co., Freeland Ave. and Walnut Lane, and an annex in the Roxboro Mills, are installing an electric power and lighting plant. They are very busy on flannels, blankets and linings.

Pennsylvania, Philadelphia. William Steele & Sons, builders, have obtained a permit for the erection of a second story addition 56 by 68 feet, to the factory of Jacob Miller Sons & Co., proprietors of the Borich Mills at 16th and Reed Sts., who manufacture cotton and woolen goods on 260 looms, using the production for their own consumption.

Pennsylvania, Philadelphia. Estimates are being asked by Ballinger & Perot, architects, for the erection of a five-story addition, 70 by 173 feet, to the Fern Rock Woolen Mills at Amber and Wishart Sts., manufacturers of cloakings, overcoatings and woolen dress goods on 224 looms. This concern is so pressed for room that they are operating a branch factory at Palethorp and Oxford streets, and have recently rented quarters in the mill at Coral and Adams streets, which they are using as an examining and burling department.

Pennsylvania, Philadelphia. The John Williams Mfg. Co., 12th and Carpenter Sts., recently reported by us as about to make many changes in their plant, have placed a contract for the erection of a fifth and sixth story to their plant to cost $18,000.

Rhode Island, Providence. The Riverside Mills are to erect a three-story building 250 by 65 feet, for skeining and dressing departments. A new boiler house will be built at the Valley Worsted Mills and one and two-story additions will be made at the National and Providence plants.

Rhode Island, Providence. The Atlantic Mills are contemplating additional improvements to the plant; a run is to be built between Mills 1 and 3, for carrying yarn.

Rhode Island, Providence. Preparations are being made by the Paramount Worsted Mill to build an addition to the plant. They will install 50 new looms.

*Rhode Island, Woonsocket. Work is nearing completion on the new building for the Lafayette Worsted Company. This addition will be used for scouring, combing and sorting department.

*Rhode Island, Woonsocket. The Alsace Worsted Co. has started work on the erection of their new addition, 165 by 55 feet, brick. This company will make worsted yarns, 10s to 60s and expect to begin operations in the annex in September.

*West Virginia, Martinsburg. The Crawford Woolen Company has completed repairs to the plant recently damaged by fire and resumed operations. The new building under construction has been completed and the machinery will soon be running.

Mills Starting Up.

Connecticut, Stafford Springs. Operations have been resumed in the Warren Woolen Mill, which has been closed for a week.

*Delaware, New Castle. Preparations are being made by M. Gambrill, who recently purchased the old woolen mills at this place, to put same in operation. Plant will be run as the Cromwell Textile Mills.

*Kansas, Topeka. The Oakland Woolen Mills, which have been idle for some time, are reported as resuming operations. Improvements have been made to buildings and machinery. It is expected to have the plant running in full within a short time. E. H. Crosby is president of the company; Geo. Neil, vice president; O. W. Neil, secretary; W. T. Crosby, treasurer and J. F. McAfee, manager.

*Maine, Madison. The difficulty with the spinners at the Madison Woolen Mills has been adjusted, and the plant is now running to full capacity.

*Maine, Vassalboro. Operations have begun in full in Herbert Pease's shoddy mill, which has been rebuilt. A new department has been started, that of making all wool shoddy, in connection with that of cotton and wool variety.

*Massachusetts, Middleboro. The Nemasket Woolen Mills Co. has been incorporated with capital stock of $75,000 to operate the Middleboro Worsted Mills. Crawford M. Barnes is president of the company; Geo. F. Sanford, treasurer and H. B. Stevens, one of the directors. A general line of fancy worsteds will be made. New finishing machinery and a plant for yarn and piece dyeing are being installed so that plant may be put in operation at an early date.

*Massachusetts, West Millbury. Operations will begin at once by the Millbury Worsted Co., organized recently to operate the Ramshorn Mills. They will make worsteds and dress goods, operating 20 looms. Product will be sold through L. Backman Co. C. A. Root is buyer for the company. All communications should be addressed to Uxbridge, where office is located.

Massachusetts, West Rutland. The Lakeville Woolen Company's mill at this place has been purchased by Fred R. Smith, of Danielson, Conn. The plant will be put in operation as soon as sufficient help is secured.

*Minnesota, Delano. Operations are about ready to be started in the Rockford Woolen Mills, which have been removed here from Rockford, Minn.

*New York, Seneca Falls. Operations have been started up in the Seneca Woolen Mills with a small force of operatives. Although no permanent company has yet been formed to continue running the mill, it is thought that the old stock on hand will be worked up preparatory to something definite.

*Pennsylvania, Norristown. The Coral Mfg. Co., whose plant was almost destroyed by fire several months ago, has been rebuilt and is now in full operation. They are running 21 broad and 16 narrow looms on art squares, rugs, etc., and doing a good business.

*Rhode Island, East Greenwich. Operations will soon be started in A. H. Esten's mill. This plant will employ about 50 people, dyeing, spooling and spinning woolen yarns.

Wisconsin, Galesville. The Galesville Woolen Mills have resumed operations after idleness of several months.

Mills Shutting Down.

Maine, Camden. It is reported that the Mt. Battie Mfg. Co.'s plant has been closed indefinitely; it had been shut down for some time, and the force is disbanding.

Pennsylvania, Philadelphia. Geo. F. Bechmann & Son, manufacturers of velvets, plushes and novelties, have discontinued business.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Massachusetts, Northampton. Operations will begin about Aug. 1st, by the Northampton Silk Company, recently incorporated with capital stock of $15,000, to operate a throwing plant. A. T. Bliss is president of the company, Geo. Bliss McCallum, treasurer. They will sell product direct.

New Jersey, Paterson. The Maynard Company has been incorporated with capital stock of $500,000. H. J. Maynard is president of the company; Bernard Mackin, treasurer, and A. S. Howard, superintendent. Concern manufactures silk ribbons and hat bands, operating 151 looms. Product is sold direct and through L. & E. Stern. This company has purchased the Meding Mfg. Co.'s plant.

New Jersey, Paterson. The Herbert Silk Co. has been incorporated recently and is installing a plant of fifty looms in the Dale Mill, Railroad Ave. They will make plain and fancy broad silk dress goods. They will install additional looms later. E. H. Hergesheimer is superintendent of the plant.

New York, New York. The Klots Throwing Company, with offices at 487 Broadway, and mills at Cumberland, Md., Fredericksburg, Va., Carbondale, Archbald and Scranton, Pa., are about to start up another plant, the plans for which have been prepared. The mill will be put in operation within a short time.

*Pennsylvania, East Plymouth. The Luzerne Silk Throwing Company contemplates starting operations in their new plant before June 1st.

Pennsylvania, Scranton. Work has been started on erecting the new building for the Tripp Park Silk Throwing Mill. This company is capitalized at $50,000. It is expected to have the plant running by August 1st. Matthias Stine is president of the company and D. J. Whiteford, treasurer.

Enlargements and Improvements.

*Connecticut, New London. The Brainerd & Armstrong Company is receiving estimates for construction of a new dye house, 160 by 287 feet, one story. A 300 h. p. boiler will be put in.

New Jersey, Paterson. The Enterprise Silk Company, which has been located at Spruce and Market Sts. for some time, is about to remove to Buffalo, N. Y., where a new building has been erected.

*New York, Binghamton. Work has begun in the new quarters of the Binghamton Silk Mill. About 40 looms have been put in place.

*Pennsylvania, Bangor. The Crown Silk Mfg. Co. has just begun work on erection of their new addition, 42 by 100 feet, 2 stories. They propose having same completed in about 2 or 3 months. This concern makes silk gloves, selling same direct.

Pennsylvania, Bangor. It is stated that the Crown Silk Co. is to double the capacity of the plant.

*Pennsylvania, Philadelphia. The old mill at Bondsville, Chester Co., recently bought by Fred. Pearson, is being equipped with machinery for the purpose of finishing the production of his plush mill at Hancock and Somerset Sts., and also the Penna. Pile Fabric Mfg. Co., located at Howard and Huntingdon Sts., manufacturers of figured plushes, and in which Mr. Pearson is also interested as president. The new plant is expected to be in operation in about a month or six weeks.

Pennsylvania, Scranton. The Sauquoit Silk Mfg. Co. has started extensive improvements to the mill at this place. New and up-to-date machinery will be installed.

Virginia, Norfolk. The Norfolk Silk Company is enlarging the capacity of the mill by installing a number of new looms and winding machines.

Mills Starting Up.

California, Petaluma. Operations will be resumed immediately in the Carlson-Currier's mill.

MISCELLANEOUS.

Massachusetts, Easthampton. A new boiler house is under way for the Hampton Company.

Massachusetts, Fall River. The Algonquin Printing Company is to enlarge the bleach house and will also erect an additional storehouse, 150 by 90 feet.

Massachusetts, Gardner. The Oxford Fibre Co. is a new concern recently organized by B. C. Mudge and Josiah Bardwell, to manufacture linen products from flax. The company is capitalized at $600,000. It is expected to have the plant in operation by Aug. 1.

*New Jersey, Bridgeton. The Martin Dye Works have begun work on erection of their new buildings. This is the company in which James Martin and James Shaw are interested.

Ohio, Xenia. The Hooven & Allison Cordage Company will erect a new mill in Cincinnati, to which the plant now at West Second Street will be removed. The new building will have a frontage of 350 feet, with two wings, extending east, each 450 feet, two stories.

Pennsylvania, Philadelphia. A charter has been applied for by William H. Burns in conjunction with Robert H. Lever and Edwin G. Sprowles to carry on the dyeing business which Mr. Burns has been running for many years at 4060 Orchard St., Frankford; Messrs. Lever and Sprowles are both connected with Mr. Burns at the present time and the new firm, under the name of William H. Burns

& Co., Inc., will continue the business of dyeing cotton warps and skein yarns at that address.

Pennsylvania, Philadelphia. Messrs. Smith & Quicksall, finishers of hair cloth, whose plant was recently burnt out at Dyre and Willow Sts., Frankford, have secured new quarters at 1706 Dyre St., where they are again in full operation.

Pennsylvania, Philadelphia. A two-story brick dyehouse, 64 by 64 feet, is to be erected on C St., above Westmoreland, at a cost of $4,000, for Marion Hagar of the Nicetown Dye Works, which is located at the same address, dyers of fast black on skein yarns and who recently put in a plant for the dyeing of hosiery.

Pennsylvania, Reading. Plans have been prepared for an addition, brick, 150 by 28 feet, one story, to the Liberty Dye Works. The new addition will be utilized partly for storage purposes and partly for printing.

Rhode Island, Providence. The Queen Dyeing Co. proposes erecting a new mill, 189 by 70 feet, brick, three stories.

Rhode Island, Saylesville. Contract has been awarded by the Saylesville Bleacheries, for erection of a large storehouse, 180 by 46 feet, brick and wood.

*Virginia, Norfolk. The Dixie Manufacturing Co., reported incorporated recently, with capital stock of $80,000, will start construction of the new buildings about July 1st, for manufacturing bagging. Steam will be power used.

Wisconsin, Eau Claire. The Eau Claire Linen Co. is extending its property at Elk Mound, about 10 miles distant.

FIRES.

California, San Francisco. The mill of the J. J. Pfister Knitting Company was destroyed by the fire which followed the earthquake. It will be rebuilt as soon as possible, and equipped with entirely new machinery, most of which will be of German manufacture.

Minnesota, Winona. The Union Fibre Co.'s plant has been entirely destroyed by fire.

Mississippi, Columbus. The Columbus Yarn & Cordage Co.'s plant has been destroyed by fire. The loss is placed at $15,000.

North Carolina, Charlotte. The South Atlantic Waste Co., which recently started up a plant as manufacturers and dealers in cotton waste, was entirely destroyed by fire, May 16th. The capital stock of the company was placed at $50,000; with D. H. Anderson, president; Geo. Stephens, vice president; John W. Todd, secretary and treasurer; L. A. Lockwood, general manager and L. A. Lockwood, Jr., superintendent. It is reported that they will rebuild.

Pennsylvania, Freeland. It is reported that a fire, probably due to an incendiary, destroyed the White Haven Knitting Mills, a small plant located in this section. The loss is estimated at $2,000.

Pennsylvania, Philadelphia. A fire which originated from friction in a picking machine in Richard Hall's Rock Hill Mill, Rock Hill Road and Belmont Ave., Manayunk, completely destroyed the plant, entailing a loss of $25,000. The building, which was 45 by 125 feet, of stone, four stories, was owned by James Dobson, who leased it to its present occupant about three years ago. The business which Mr. Hall conducted, which consisted of manufacturing carpet yarns, has been steadily increasing and only recently the capacity of the plant was doubled. It is not known whether the mill will be rebuilt or not.

Pennsylvania, Philadelphia. A fire which started among some yarn in the dye house of Stead, Miller & Co., on Bodine St., above Huntingdon, created considerable excitement among the 75 employes of the plant during the first week in May. The blaze, caused by spontaneous combustion, did little damage, but the water damaged the building and contents to the extent of $15,000, which will be repaired at once.

Pennsylvania, Philadelphia. The mill at Asburner St. and Penna. R. R., occupied jointly by W. F. Taft & Co., manufacturers of eiderdowns and the Hitchner Wall Paper Co., was completely destroyed by fire May 5, with a loss estimated at $110,000. It is not known whether Taft & Co. will start up again as their plant has not been in full operation for several months, only two or three operatives being employed at the time the fire occurred.

South Carolina, Bamberg. The Bamberg Cotton Mills have been destroyed by fire. The loss is placed at $40,000.

FACTS AND GOSSIP.

California, Santa Rosa. The Santa Rosa Woolen Mills comprise the only brick building which has remained standing during the recent earthquake. Operations have been suspended temporarily.

Canada, Toronto. Messrs. Purvis & Lees are contemplating establishing a plant for making absorbent cotton, etc., but as yet have not settled all preliminaries.

Canada, Toronto. The Dominion Novelty Manufacture Co. has been incorporated with capital stock of $50,000, for manufacturing novelties. W. H. Shaw is president; Farquhar Shaw, secretary and treasurer.

Connecticut, Clark's Falls. It is reported that the Clark's Falls Felting Mill has resumed operations after a period of idleness.

*Connecticut, Hartford. The Reliable Manufacturing Co. has closed the mill at this place, preparatory to removing to Canaan, where new building is being equipped.

Connecticut, Norwichtown. Chas. H. Kimball, who has been operating a small plant here, weaving "Pequot" rugs, coverlets and portieres, is erecting a new building for purpose of enlarging the plant. The product is sold direct.

Connecticut, Putnam. The Bay State Worsted Co. is operating Mill No. 2 at this place until 9 o'clock evenings.

*Connecticut, South Coventry. The John Wood Mill, recently purchased by the Messrs. Washburn,

will be operated as the Washburn Silk Company, making twist and silk thread. New machinery is being installed and the power increased to 40 h. p. Operations will be resumed shortly with about 40 people.

Georgia, Atlanta. The Southern Rug and Carpet Mills are discontinuing the manufacture of wool and jute Smyrna rugs, owing to the unsatisfactory condition of the trade in this line. They are making a new rug called the "Criterion," of a solid weave.

Georgia, Dalton. M. C. Foster is reported as interested in organizing a new company with capital stock of $200,000, to operate the Elk Cotton Mills. An equipment of 7,500 spindles for manufacturing yarns is proposed.

*Georgia, McDonough. We have been advised by E. M. Copeland of this place that a cotton mill is contemplated with capital stock of $75,000. They are desirous of obtaining information as to the most profitable line to make and equipment, etc.

*Georgia, Moreland. We have been advised by the Moreland Manufacturing Company that they have the necessary power to operate a knitting mill and have had the proposition under consideration for some time. Just at present the company is exceedingly busy in their own line (manufacturing crates) and will not be in a position to consider the knitting mill project for about 60 or 90 days.

*Georgia, Rome. We have been advised by the Cherokee Water Milling Co. that they have not yet definitely decided as to the new plant, but are considering Rome mill.

Georgia, Savannah. The Savannah Specialty Manufacturing Company has been incorporated with capital stock of $75,000 for purpose of manufacturing textile specialties. R. D. Hamilton and S. S. Jones are interested.

*Kentucky, Hopkinsville. It is reported that the James Cates & Son Co. has been incorporated with capital stock of $25,000, to operate a plant for manufacturing cotton and woolen goods.

*Maine, Waterville. It is reported that the mill and property of the Riverside Worsted Company has been sold by the receiver to Robert Lattimer of Dexter, Me., for $67,100.

Maryland, Baltimore. The Baltimore Waste Co. is to install 2 additional waste machines, which will give a total of 100 tons waste per day.

Maryland, Elkton. The Deibert & Wilson Textile Manufacturing Co. has been incorporated with capital stock of $50,000, to continue the plant operated by Messrs. Deibert & Wilson.

Massachusetts, Fall River. The Wampanoag Mills have placed a repeat order for revolving flat cards with the Howard & Bullough American Machine Co., Providence, R. I.

Massachusetts, New Bedford. The Barbour Silk Mill Company has closed the plant and assigned the property to a trustee for benefit of the creditors. It is stated that the shut down is only temporary.

Massachusetts, New Bedford. It is rumored that some changes are about to be made in the management of the Acushnet and Hathaway Mills, the rumor being that upon retirement of John W. Knowles as agent, W. A. Twiss, present superintendent of the Hathaway Mills will be promoted to agent and will have charge of both mills.

Massachusetts, New Bedford. The Butler Mill is now operating 100,000 spindles and 1,734 looms, having completed installation of the machinery first proposed.

Massachusetts, New Bedford. Preparations are being made by the Bristol Manufacturing Company to build a new weave shed for their fine combed yarn department. The foundations have been put in. It is hoped to have the plant ready to start operations in the fall.

Michigan, Detroit. The Western Robe Company will hereafter be known as the Hugh Wallace Company. The capital stock has been increased to $400,000.

Mississippi, Batesville. C. B. Vance, J. C. Price and W. W. Perkins are reported interested in a new company organized for purpose of manufacturing yarns and cordage. It is expected that the new plant will be in operation by Sept. 1.

*Mississippi, Columbus. The Columbus Yarn & Cordage Co. will start at once rebuilding the plant recently destroyed by fire. The new plant will have a larger capacity than the old mill.

New Jersey, Paterson. F. A. Strauss & Co. have made arrangements whereby the silk mill at this place will be removed to their plant at Trenton, N. J.

New Jersey, Paterson. Henry E. Kauffmann, operating a silk plant on Water Street, is in financial difficulties. The liabilities are placed at $16,000 with assets of about $7,000. A receiver will be named by the Courts. Mr. Kauffmann has disappeared.

New Jersey, Paterson. Altshuler Bros., operating a silk mill at this place, have been petitioned into bankruptcy. U. F. Wilcox has been appointed receiver.

New York, Amsterdam. The Amsterdam Silk Mills, Louis Lichtenheim, proprietor, have been sold to Julius Kayser & Co., of New York.

New York, Buffalo. It is reported that the Cleveland-Akron Bag Co. of Cleveland has leased a large building at this place and is altering same for purpose of making all kinds of bags, jute, paper, etc.

New York, Cohoes. The John H. Murphy Company has been incorporated with capital stock of $22,000, to continue plant of same name. John H. Murphy is president of the company; James Aitken, treasurer. This plant is equipped with 76 knitting and 100 sewing machines on ribbed underwear.

New York, Le Roy. It is reported that the Le Roy Cotton Mills have been organized with capital stock of $200,000 and that a plant will be established here in the old Malt house, to be remodeled.

*New York, New York. Charles Wilson is president of the reorganized Standard Rope & Twine

Co., now to be known as the Standard Cordage Company. Among the directors are J. B. Clews, W. J. Wellman and S. B. Thompson.

*New York, Saratoga Springs. Operations will soon start in the new plant established here by the Clark Textile Co. The machinery from the Sidney mill will be removed here in June.

New York, Utica. At recent meeting of the stockholders of the Skenandoa Cotton Company, Francis P. Fitzsimmons was elected treasurer to succeed Mr. Rogers. The capital stock is to be increased to $1,000,000 for the purpose of making certain improvements.

*North Carolina, Concord. At meeting held recently by the directors of the Cannon Manufacturing Company, it was voted to increase the capital stock from $200,000 to $1,000,000, and to increase the paid in capital from $200,000 to $600,000. It is proposed to build a new mill of about 30,000 spindles with necessary looms.

North Carolina, Durham. The Erwin Cotton Mill has been authorized to increase the capital stock from $3,000,000 to $5,000,000.

*North Carolina, Granite Falls. We have been advised by the Dudley Lumber Company that they have not yet fully decided about erection of their new mill.

*North Carolina, Greensboro. We have been advised by the Proximity Mfg. Co. that they are considering doubling the capacity of their spinning plant, but have not yet reached any definite decision.

North Carolina, Saxapahaw. The White, Williamson Company has been incorporated to operate the mills operated by the above company. Capital stock is $200,000.

Oregon, Pendleton. It is reported that a project is under way for resuming operations in the Pendleton Woolen Mills.

*Oklahoma, Guthrie. J. B. Beadles has been appointed to succeed Wm. H. Coyle as president of the Pioneer Cotton Mill Co. Steps will be taken at once on construction of the necessary buildings.

Pennsylvania, Bridgeport. The Sterling Mills Co., with a capital of $100,000, are operating 5 sets, 2,500 spindles and 38 broad looms on cassimeres, which they dye, finish and sell through New York. The plant was formerly equipped with 88 narrow looms, which have been replaced by those of the broad variety. They report a good business.

Pennsylvania, Chester. The J. E. Fricke Company, 253-55 Market Street, Philadelphia, who recently purchased the mill formerly operated by the late Standard Spinning Co., are operating it on ropes and twines which they sell direct. The company is now on the market for braiders and machinery for the manufacture of this class of goods, it being their intention to make this plant one of the most up-to-date in the country.

Pennsylvania, Chester. The Lincoln Mfg. Co., at 10th and Morton Ave., with a capital of $200,000; T. A. Blythe, president; N. P. Sloan, treasurer, and G. C. Turner, superintendent, is very busy on combed and carded yarns, warps, cones, tubes and skeins. Plant is equipped with 12,000 ring and 2,160 twisting spindles.

Pennsylvania, Chester. The Grove Worsted Mills, which have been operated by F. A. Straus & Co., have been sold to the Kennebec Worsted Mills, of Philadelphia, Pa., who will operate same as a branch mill.

Pennsylvania, Lenni Mills. Work has almost been completed removing the plant of the Daniel Lees Estate to the Glen Riddle Mills at Chester.

Pennsylvania, Norristown. Abraham Hirsh & Company, not incorporated, has succeeded to the business of Hirsh & Lazarus, proprietors of the Penn Art Square Mills at 351 to 357 E. Lafayette Street. They are manufacturing art squares and have recently increased their loom equipment to 20 broad looms. The capital of the company is $20,000. They sell direct.

Pennsylvania, Philadelphia. The Wabash Mills Co., spinners of carpet and blanket yarns and wool spun cotton yarns on 11 sets, 2,525 spindles, are very busy. The office of the company, which has been located at 203 Church Street, will, in the future, be located at the mill. The business is under the supervision of Mr. Arthur N. Leeds, who does the buying for the plant.

*Pennsylvania, Philadelphia. David H. Stroud, manufacturer of rugs, chenille curtains and covers, is retiring from the business.

Pennsylvania, Philadelphia. The German-American Hosiery Co. has placed an order with Mr. Otto Walther (507 Bourse, Philadelphia), the American representative of Schubert & Salzer, for 21 full fashioned hosiery machines of eighteen sections each. They manufacture an extensive line of ladies' and misses' cotton and lisle, plain and ribbed full fashioned hosiery. The demand for their hosiery is increasing steadily. The Mill building will be enlarged to accommodate the additional machinery. The officers are: Robt. Meyer, president; Henry Haenser, treasurer, and Rienhard Huetting, superintendent.

Pennsylvania, Philadelphia. Tilton & Keeler, American and Diamond Sts., are very busy on lace curtains, operating 80 sewing machines. Charles B. Stretch, Jr., is the superintendent. This firm does not weave, simply buys the materials from which the curtains are made and then converted into the salable article.

*Pennsylvania, Philadelphia. Harry Stott, reported to start up plant at Woodland and Sullivan Sts., for manufacture of toweling, etc., has decided not to do so at this time.

Pennsylvania, Philadelphia. It is reported that the Salts Textile Co., of Bridgeport, Conn., who recently purchased the entire equipment of the velvet and plush plant of George F. Bechmann & Son, at 69th and Haverford Ave., are seeking quarters in this city in which to install the machinery and start it up again as a branch mill.

*Rhode Island, Olneyville. The partnership existing between Messrs. Guile & Waterhouse, operating the Earnscliffe Mills, has been dissolved. The plant will be continued by Walter A. Guile, who has purchased Mr. Waterhouse's interest.

Pennsylvania, Somerset. Cook, Emert & Co., formerly of Listonburg, have removed to this place and been incorporated with capital stock of $40,000.

Rhode Island, Sayesville. The Crefeld Waste & Batting Company has recently increased capital stock to $500,000.

Rhode Island, Shannock. The Columbia Narrow Fabric Company has installed some new looms in the plant.

South Carolina, Anderson. Fire which has destroyed the Anderson Light & Power Co.'s plant has caused shut down of several mills, dependent on same for motive power. The other mills will operate the plants night and day until plant is rebuilt, giving employment to the idle operatives.

*South Carolina, Clinton. The Lydia Cotton Mills, which have been reported as contemplating adding 10,000 spindles and additional looms, advise us that they expect to make the addition some time, but at the present it is indefinite. The end of the mill is boarded up ready for the addition. They are investigating the cost of machinery equipment and are giving that matter consideration.

South Carolina, Darlington. The stockholders of the Darlington Manufacturing Company held a meeting on the 15th inst., and elected new officers. G. H. Milliken, New York, was elected president and C. C. Tritty, treasurer and general manager. $500,000 has been voted as preferred stock.

South Carolina, Pickens. W. M. Haygood, president of the Glenwood Cotton Mills, Easley, S. C., is reported as interested in building a $250,000 cotton mill at this place.

South Carolina, Rock Hill. It is now an almost settled fact that Rock Hill will have another cotton mill. The capital of the concern will be $400,000 and of this amount the city is to contribute $100,000. Practically all of this amount has been taken by the city and no difficulty will be met in placing the small amount that remains. The mill will contain 20,000 spindles. Mr. Alexander Long of Darlington is in charge of the new mill. The name of the new concern will be the Argon Cotton Mill.

Tennessee, Knoxville. It is reported that the Brookside Mills propose enlarging their plant in the near future, with about 40,000 additional spindles and 200 looms.

*Tennessee, Morristown. The Morristown Woolen Mills have been incorporated with capital stock of $100,000. A. B. Kesterson is president; R. H. Wright, vice president; G. A. Russell, secretary and J. B. McCord, treasurer. Woolen yarns will be made, also knit goods and blankets and similar woolen goods.

Virginia, Norfolk. The Dixie Manufacturing Company has recently been incorporated with capital stock of $80,000, for purpose of manufacturing bagging. A. M. Agelasto is president of the company; P. A. Agelasto, treasurer, and C. P. Twiford, secretary.

Personals.

Obadiah Butler has accepted the position as superintendent at the New York Mills, New York, under General Superintendent Powers. Mr. Butler has recently been superintendent of weaving at the Hathaway Mills in New Bedford and has had an extensive and varied training in mill work, having been with the Dartmouth, Potomska and other mills.

S. G. Hall, agent for the Wilton (N. H.), Woolen Co., has resigned to accept a similar position with the Mt. Battie Mfg. Co., Camden, Me.

A. I. Whitehouse has been appointed superintendent of the mills of the Michigan Central Woolen Co. at Centerville.

C. T. Gardner has resigned his position as overseer of the cloth room at the Massachusetts Cotton Mills of Lowell, which he has held for the past five years.

M. G. Morrell, formerly overseer of spinning for the Attawaugan Company's mill at Killingly, Conn., has been promoted to superintendent of that company's mill at Ballouville, Conn.

William Pender has again taken the position as superintendent of the Pondville Woolen Mills, Auburn, Mass., a position he filled satisfactorily some time ago.

H. G. Tietze, of Cherry Valley, Mass., has accepted a position as overseer of spinning with the Oregon City (Ore.) Mfg. Co.

Ernest Rhodes, formerly with the Broad Brook Woolen Mills, Broad Brook, Conn., has accepted a position in the designing room of one of the American Woolen Company's mills in Rhode Island.

Ira D. Martin has resigned his position as overseer of weaving for the Brigham Woolen Co., Danielson, Conn., and has been succeeded by Mr. Cogswell of the Assawaga Co., Dayville, Conn.

John G. Kearns, of Uxbridge, Mass., has accepted a position as overseer of finishing for the Dawson Mfg. Co., Holden, Mass. Mr. Kearns has been overseer of finishing for the Hecla Mill of Uxbridge, Mass., for a number of years.

Maurice J. Foley, recently with the King Philip Mills, has taken the position of overseer of carding with the Pocasset Mfg. Co., Fall River, Mass.

F. S. Elliott has taken charge of the carding in Cavendish (Vt.) Woolen Mills.

Michael Crowley has resigned his position as overseer in the spinning department of the Clinton Mills, Woonsocket, R. I.

Joseph Beaulieu, who has been second-hand in the spinning room of the Manville Co., has resigned to take charge of ring spinning at the Clinton Mills, of Woonsocket, R. I.

A. E. Bullock, of Wauregan, Conn., has taken the position of overseer of carding in the Bernon Mills, Georgiaville, R. I.

Chas. Weeks has again entered the employ of the Northboro Woolen Mills, Chapinsville, Mass., as overseer of carding, a position made vacant by James J. Grady, of Wilton, Maine.

Samuel B. Wescott, for nearly 26 years overseer of carding for the Elizabeth Mills, Hillsgrove, R. I., has resigned his position and will retire from active work. He will be succeeded by A. Cooper, of Monchaug, Mass.

William Batchelder has recently been elected general manager of the Goodall Worsted Co., of Sanford, Me., and The Maine Alpaca Co., of Sanford and Springvale, Me.

J. F. Leavitt, formerly of Biddeford, Me., has taken the position as superintendent of the Griswoldville Mfg Co, of Griswoldville, Mass.

Walter Skerry has taken the position as superintendent of the Enterprise Worsted Mills, of Millville, Penn.

J. J. Driscoll has accepted a position as overseer of spinning for the Chas. M. Davis Co., of North field, Vt.

James L. Manning, of Providence, R. I., has accepted a position with the Taunton Dye Works & Bleachery Co., of Taunton, Mass.

B. Kemp has been appointed asst. supt. of the Renfrew Mfg. Co., of Adams, Mass., to succeed Chas. R. Thompson, appointed supt.

George Crozier, formerly overseer of carding for the Berkshire Cotton Mfg. Co., Adams, Mass., has taken the position as superintendent of the Greylock Mills, of North Adams, Mass.

Peter Graham, of Fitchburg, Mass., has taken charge of the dyeing for the Renfrew Mfg. Co., of Adams, Mass., succeeding John Carr, resigned.

Joseph Marshall, has resigned his position as superintendent of the Lackey Mfg. Co., Newburg, N. Y., and been succeeded by Samuel Pashley.

J. Henry Lord, formerly overseer of weaving for the Indian Springs Woolen Co., Madison, Me., has resigned his position to accept a position as superintendent of the Fort Casimir Woolen Mills, of New Castle, Delaware.

George A. Moody, superintendent of the Warren Cotton Mills, of West Warren, Mass., has resigned his position on account of ill health.

John Sheerin, for several years overseer of spinning for the Pontoosuc Woolen Mfg. Co., of Pittsfield, Mass., has resigned his position on account of ill health. Mr. Sheerin has been succeeded by Joseph Ringie.

Samuel B. Wescott, for twenty-six years overseer of carding for the Elizabeth Mills, at Hillsgrove, R. I., has resigned his position and will retire from active work. He will be succeeded by A. Cooper, of Manchaug, Mass.

C. J. Huss, formerly superintendent of the Loray Mills at Gastonia, N. C., has resigned his position, and has been succeeded by B. J. Dobbins, of Appelaichie, S. C.

Joseph H. Ridings has resigned his position with the Plainfield Woolen Co., Central Village, Conn., to accept the position as superintendent of the dyeing and finishing plant of the Jersey Cloth Co., Methuen, Mass.

George F. Ship, formerly assistant superintendent of Tifton Cotton Mills, Tifton, Ga., is now general manager of the Millen Mills, Millen, Ga.

William E. Clogher, formerly superintendent of a woolen mill in St. Mary's, Ohio, is to enter the employ of the Hudson Blanket Co. of Hudson, Mass.

Frank Wood, formerly of the Dunn Worsted Co., Woonsocket, R. I., has accepted the position as overseer of finishing for the Plainfield Woolen Co., Central Village, Conn.

Chas. Griffith, formerly overseer of dressing for the Cowan Woolen Mills, Lewiston, Me., has accepted a similar position with the Brigham Woolen Mills of Danielson, Conn.

Robert McMahon, formerly overseer of spinning for G. F. Whipple of Oakland, R. I., has resigned his position.

B. Donnelly, Woonsocket, R. I., is now overseer of weaving for the Hope Worsted Co., Oakland, R. I.

J. T. O'Brien, formerly overseer of weaving for the Nasonville Woolen Co., Nasonville, R. I., has taken a similar position with the Glen Worsted Co., Harrisville, R. I.

John Cronin has succeeded J. G. Burnes as superintendent of the Wabash Mills, Manayunk, Pa.

Enoch H. Miller has been placed in charge of buying the weave room supplies at the Lower Pacific Mills, Lawrence, Mass., taking the place of Wm. M. Coulie, who resigned.

B. H. Zimmerman, formerly assistant manager of the Oneita Knitting Co., Utica, N. Y., has taken the position of general manager of the Hacket & Atwood Knitting Mills of Stittville, N. Y.

Chas. Pelisser, of Northampton, Mass., has succeeded Mark B. Smith as overseer of dyeing at the A. H. Rice Co. Silk Mills, Pittsfield, Mass., who resigned.

Ellis Foster, at one time general manager of a large woolen and worsted combing and spinning plant in Gottenberg, Sweden, has taken the position of superintendent of the worsted spinning department of the Arlington Mills, Lawrence, Mass., to succeed the late Mr. Haeberle.

The executives of the various departments of the new Wood Worsted Mills in Lawrence, Mass., have now been all appointed. Most of them come from other mills of the American Woolen Company; in fact only three of the new heads come

from other textile plants. They are Agent Lyon, Yardmaster Charles W. Hale and Head Watchman Thomas C. Jones. The complete roster follows: Agent, A. S. Lyon; cashier, Frank A. Sherman; paymaster, C. A. Kendrick; master mechanic, Thomas Somerville; designer, Ernest C. Curran; engineer, David H. Wilson; superintendent of carding, James Boothman; superintendent of combing, Frank C. Berwick; superintendent worsted spinning, Walter M. Lamont; superintendent drawing, Elijah Strickland; superintendent twisting, beaming and spooling, Walter Cox; superintendent weaving, J. Paul Gaudes; superintendent dressing, George Kemp; superintendent dry finishing, Robert Bingham; superintendent wet finishing, Joseph Batty; shipper, Lattimer Ballou; superintendent burling and mending, Herbert B. Shaw; carpenter, Charles M. Bunten; yardmaster, Charles W. Hale; superintendent of watchmen, Thomas C. Jones.

John W. Stevenson, Jr., superintendent of the Fulton Mills, Fulton, N. Y., has been appointed agent to succeed Frank E. Weeden, who has resigned.

Frank E. Weeden, agent of the Fulton Mills, Fulton, N. Y., of the American Woolen Co., has resigned that position to accept the position of manufacturing inspector of all the mills of the company.

George N. Smith has accepted the position as overseer of carding and spinning for Henry W. Lindley of Camden, N. Y.

Hartley L. Lord, resident agent for the Chicopee Mfg. Co., Chicopee, Mass., has resigned his position to take a position as general manager of the two mills of the Union-Buffalo Co., Union, S. C. He will be succeeded by M. A. Rawlinson, superintendent.

Arthur Butler has severed his connection with the Butler Mills of New Bedford, Mass., where he had charge of fancy weaving.

Obadiah Butler, who recently resigned his position at the Hathaway Mill, New Bedford, Mass., has been succeeded by his brother, formerly second hand in the same mill.

George Smith is to resign his position as overseer of weaving for the Dartmouth Mills, New Bedford, Mass.

Fred Dawson, designer at the Nashua Valley Mills, Clinton, Mass. has resigned to accept a position with the Tillotson Mfg. Co., Pittsfield, Mass.

Marshall W. Driver has resigned as superintendent of the Canton (Ga.) Cotton Mills to accept a similar position with the Eureka Mills, Chester, S. C.

Wm. E. Helliwell has resigned his position at the Sutton Mills, North Andover, Mass., to accept the place in the designing department of the Washington Mills, Lawrence, made vacant recently by Ernest Curran.

Thomas Hennessy of Adams, Mass., has gone to Forestdale, R. I., to accept a position as overseer of beaming in the new mill operated by the Forestdale Mfg. Co.

George W. Hinman, for the last twenty years overseer of carding for the Dwight Mfg. Co., Chicopee, Mass., has been obliged to resign his position, owing to ill health.

Samuel Hird of Manchester, Conn., has been appointed superintendent of the Mississippi Mills, Wesson, Miss.

John McElwain, former overseer at the Suttons Mill, North Andover, has accepted the position of overseer of dyeing for the mills owned by Robert Blakee in Webster and Sabattus, Me.

Geo. A. Moody, who has been superintendent of the West Warren (Mass.) Cotton Mills, has resigned. He will be succeeded by William P. Holt, of the Barnaby Mills, Fall River, Mass.

Timothy Mooney has been appointed superintendent and agent of the Peabody Manufacturing Co., Newburyport, Mass.

Andrew Walker of St. Joseph, Mo., has taken charge of the carding and spinning in the mills of the Western Woolen Company at Topeka, Kans.

W. A. Wheat has gone to the Chiquola Mill, Honeapath, S. C., as overseer of spinning.

A. B. Widdoes has resigned as superintendent of the Walker Mills, East Wilton, Me., to accept a similar position with Chas. J. Amidon & Sons in their mills at Hinsdale and Wilton, N. H.

A. T. Baker, recently with the Butler Mill, New Bedford, Mass., has returned to the No. 2 mill of the Acushnet Corporation as overseer of weaving.

Alfred Bradley, overseer of weaving at the Gosnold Mills, New Bedford, Mass., has resigned. He will be succeeded by Mr. Coderre of the Butler Mills in the same city.

Thomas Crossland, recently overseer of carding at the Jenckes Mill, Pawtucket, R. I., has been appointed superintendent of the Skenandoa Cotton Mills, Utica, N. Y.

Walter S. Hobbs, formerly with the Somerset Mfg. Co., Raritan, N. J., has accepted the position of designer with the Assawaga Co., Dayville, Conn.

Wm. P. Holt has been appointed superintendent of the Thorndike Mills, West Warren, Mass.

R. D. Marnoch, for many years overseer of carding at the Shove Mills, Fall River, Mass., has resigned.

Walter Whitfield has been appointed assistant superintendent of the Maine Woolen Co., Old Town, Me.

George Wishart has accepted the position as overseer of dyeing for the Assawaga Company of Dayville, Conn.

F. A. Cumnock, recently with the Anderson Cotton Mills of Anderson, N. C., has taken the position as superintendent of the Continental Mfg. Co. of Charlotte, N. C.

J. W. Kidd has resigned his position as superintendent of the Avon and Gastonia Cotton Mills at Gastonia, N. C.

Arthur L. Ware, formerly manager of the Van Deventer Carpet Co., of Greensboro, N. C., has

taken the position as manager of the Southern Rug & Carpet Co., of Atlanta, Ga.

F. J. Clark, for some time overseer of spinning at the Chiquola Mill, at Honea Path, S. C., has taken the position as assistant superintendent of the Ware Shoals Mfg. Co., of Ware Shoals, S. C.

John A. Thomas, formerly of the Coronet Worsted Co., of Mapleville, R. I., has taken the position of overseer of weaving for the Peace Dale Mfg. Co., Peace Dale, R. I.

Joseph Ellam has resigned his position as overseer of weaving for the Lancaster Mills, of Clinton, Mass.

Alex Marshall, formerly of the Arlington Mills, of Lawrence, Mass., has taken the position as designer for the Selden Mills, of Methuen, Mass.

Thomas Rawley has resigned his position as superintendent of the Rochester Woolen Co., Rochester, N. H., to take a similar position with the Walker Mills, East Wilton, Maine.

Charles Gledhill, formerly with the Oakland Mfg. Co., has taken a position with the Westmoreland Dye Works, of Philadelphia, Penn.

C. W. Carpenter, formerly of Ashton, R. I., has accepted the position as overseer of carding for the Monadnock Mills, of Claremont, N. H.

Charles Hayes has been appointed superintendent of the Skenandoa Yarn Mills, of Utica, N. Y., to succeed D. W. Gray, resigned.

John Cropper has succeeded F. H. Linker as overseer of finishing for the Tekcips Dyeing & Finishing Co., of Methuen, Mass.

Harry Haigh has resigned his position with the Maine Woolen Co., Oldtown, Me., to accept the position as overseer of dyeing and wet finishing for Curtis & Youland, Wegatchie, N. Y. He is succeeded by John King at the Maine Woolen Co.

J. H. Hendry has taken the position of superintendent of the Brookville Woolen Mills, Brookville, Pa.

J. S. Brooks, formerly of the Mt. Battie Woolen Mills, Camden, Me., has taken the position as overseer of finishing for the Indian Springs Woolen Mills, Madison, Me.

Joseph H. Ridings, formerly overseer of finishing for the Plainfield Woolen Co., Central Village, Conn., is now overseer of dyeing and finishing for the Jersey Cloth Co., of Methuen, Mass.

S. C. Wilson, formerly overseer of finishing for the Riverview Worsted Mills, Waterville, Me., has taken a similar position with the Standard Worsted Mills, of Plymouth, Mass.

W. H. Collins, formerly overseer of finishing for the Madison Woolen Co., Madison, Me., has taken a similar position with the Sawyer Mills, at Dover, N. H.

Fred H. Green, who has been overseer of finishing in a number of large mills in the New England States, has accepted a position as traveling salesman for the J. B. Ford Co., Wyandotte, Mich. Mr. Green has been with this company since April 1, and is meeting with good success.

Edward H. Heine, formerly overseer of weaving for the Saranac Mills, Blackstone, Mass., but more recently with the French River Textile Co., of Mechanicsville, Conn., has accepted a similar position with the Plainfield Woolen Co., of Central Village, Conn.

Deaths.

Henry Erben of Philadelphia, Pa., died recently in California after a long illness. He was born in Philadelphia in 1845 and has been connected with the worsted business in that city for many years, being the founder of the present Erben, Harding & Co.

Joseph Hollinrake, of Sanford, Me., died Apr. 18, at the age of fifty-one. Mr. Hollinrake was born in England in 1855 and at an early age entered the employ of the Priestly Co., finally becoming its superintendent. In 1889 he came to the United States and soon after was made superintendent and director of the Goodall Worsted Co., and of the Maine Alpaca Co., of Sandford, Me.

August J. Tiedeman, secretary and treasurer of the Beckman Co., proprietors of the Northern Ohio Blanket Mills, at Cleveland, died recently after a long illness at the age of forty-two.

George Wilcox, for more than forty years overseer of bleaching for the Hamilton Woolen Co, Globe Village, Mass., died at the home of his daughter, May 16, at the age of 86 years.

Robert Megowan, a prominent manufacturer of dress goods, died at his home in Frankford, Pa., May 5th, after a short illness.

John C. Erickson, superintendent of the Boston Thread and Twine Co., died May 6th at his home in Jamaica Plain. Mr. Erickson had been with the firm for 21 years.

Joshua S. Holland died in the afternoon of May 1st at his home in Dover, N. H. He was formerly superintendent of the Cocheco Mfg. Co. when his father was agent.

William Gregory, a well known manufacturer of mohair braids, died recently at his home in Paterson, N. J., at the age of fifty-six. He was born in Manchester, England, but came to this country when a boy, and entered the braid business in the early seventies. He is survived by a wife and three daughters.

M. J. McNamara has resigned his position with the King Knitting Mills of Kutztown, Pa., on account of poor health.

John Knott, the manager of the Pleasant Valley Cotton Mills at Pleasant Valley, N. Y., who died recently, had been in the employ of Garner & Company for 20 years; before that he was with the well known English machine builders, Parr, Curtis & Maddley, erecting their machinery in various parts of the world. He was with Garner & Co. at the Harmony Mills until 1894, after which he took charge of their mills at Pleasant Valley. This latter mill is now closed down indefinitely.

Henry Drake, for anumber of years overseer of carding for the Raritan Woolen Co., Raritan, N. J., died May 26, after one week's illness.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The Selling Magazine.

A new trade journal has recently been established which seems to fill a niche not previously occupied. It is devoted to the marketing of machinery, tools, equipment and supplies. Its publisher, Emerson P. Harris, Postal Telegraph Bldg., New York, is exceptionally well qualified for the task he has undertaken, and has gathered about him lieutenants who are specialists in this work.

There are many publications devoted to methods of machinery manufacture, but this one will be devoted especially to the important problem of selling the product of the machine shop. The first number contains much that is of interest along these lines. Every builder and advertiser of machinery would do well to send for a sample copy of this publication. The subscription price is $1.00 per year.

The Economical and Successful Management of Cotton Mills; by Henry D. Martin; 221 pages, 6 by 9; published by the author. Price $1.00.

This volume contains a series of articles by Mr. Martin in which he treats of many of the practical problems that are constantly arising in mill management. The following abstract of the table of contents gives an idea of the scope of the work: The Practical Man in a Cotton Mill; The Value of Reading Textile Papers; How to Straighten out a Cotton Mill; How to Prevent Mill Fires; Office Training; How to Build a Bobbin of Yarn; How to Reduce Waste and Bad Work; An Accounting System for the Power Plant; How to Maintain Production; The Operative Value of Spindles; The Practical Management of Ring Twisters; Unusual Cotton Mill Problems; Testing Strength of Yarns.

English Cotton Spinners' and Manufacturers' Directory; John Worrall, Oldham, England. Price $2.50.

We have received the 1906 edition of this well-known directory of Lancashire cotton mills. It has been carefully revised and brought to date to include the changes in old mills and the addition of new ones. The additions are especially important because of the remarkable development in the cotton manufacturing industry in England at the present time. When the directory went to press these additions brought the machinery in Lancashire mills to the imposing total of 48,322,684 spindles and 684,811 looms. This directory can be procured through the Lord & Nagle Co.

Business Literature.

The Protection of a Monarch; Consolidated Engine Stop Co., New York City.

This pamphlet shows what the Monarch Engine Stop and Speed Limit System is doing in various parts of the country. The illustrations include a few of the well-known plants that are under the protection of the Monarch. The book also contains a number of photographic reproductions of letters received from users of the Monarch system, and which are conclusive evidence of the merits of this engine stop. A copy will be mailed upon application to the Consolidated Engine Stop Company.

Increasing Business.

The Arabol Manufacturing Co. have found it necessary to take larger quarters. This change of office does not mean a change of address, as they have taken the fourth floor of the new annex to the Woodbridge Building, where they have been located for the last three years. Their mailing address remains 100 William Street, while visitors will find it more convenient to take the John Street entrance.

The Arabol Manufacturing Company is well known to the trade for the excellence and the popularity of their sizings, finishing materials, Turkey red oil, soluble oil and alizarine assistants.

Engraving Copper Rolls for Calico Printing.

With the aim of obtaining half-tone effects on cotton goods, a Glasgow calico printer has patented the following method. A half-tone negative is first produced by photography, from an original design. A print from this negative is prepared, in accordance with the usual bichromate process, and is "rolled up" with greasy ink—that is to say, a roller such as used by lithographers for rolling up litho stones, is charged with greasy lithographic ink and is rolled carefully over the surface of the print, which takes up sufficient ink on the design for the reproduction thereof on the surface of the stone. After the design has been properly put on the stone a transfer is taken off it on paper, in the manner commonly followed by lithographers, with a greasy ink, and this is applied to a prepared surface on the copper roller. This prepared surface may be made by coating the roller with a thin covering of bitumen or a bitumenous compound. The paper transfer is preferably applied to the copper roller by rubbing it down thereon. After the transfer of the design in the greasy ink to the surfaoe of the copper roller, the latter can be etched by the customary methods so as to produce the design upon the roller.—Textile Manufacturer.

The Wood Worsted Mills, as South Lawrence, Mass., will be heated and ventilated by one of the largest fan blower installations ever made. The order has already been placed with the B. F. Sturtevant Co., of Boston, Mass., for eight large duplex apparatus, each consisting of two steel plate fans driven by horizontal engines and of a heater, all of which will be used for the main mill. In addition another duplex apparatus will be installed in the dye house, and a separate steam fan, with heater and distributing system, will serve to maintain perfect ventilation and equable temperature in the large office building.

Commencement Exercises.

LOWELL TEXTILE SCHOOL.

The graduating exercises of the class of 1906 of the Lowell Textile School were held in Assembly Hall, May 31. There was a large attendance, the principal address being made by Gov. Guild. Other addresses were made by Speaker Cole of the Massachusetts House of Representatives, Mayor Casey of Lowell, Hon. Joseph Walker of Brookline, and Hon. John Martin, president of the Massachusetts Board of Education. The medal of the New England Cotton Manufacturers' Association for special excellence in the cotton manufacturing course was awarded to Herbert C. Wood of Lowell, the committee making the award consisting of Frederick A. Flather, W. S. Southwick, and C. C. Hedrick. Special prizes were awarded as follows, the formal presentation being made by Charles H. Eames, secretary of the school: For the best thesis, Frank E. Fleming, Lowell; First year chemistry—first prize, Leonard S. Farr; second prize, Albert F. Musgrove; Second year chemistry—first prize, Chester J. Farmer; second prize, George W. Hathorn.

It is gratifying to be able to record that the Lowell Textile School is enjoying a high degree of prosperity, the number of scholars being in excess of the number in all the textile schools of Great Britain.

NEW BEDFORD TEXTILE SCHOOL.

The commencement exercises of the New Bedford Textile School were held in Odd Fellows' Hall, on June 1. Among those in attendance were Lieut-Gov. Draper and Walter Ballou Jacobs, Professor of Education at Brown University. There were five diplomas awarded for the complete day course and two for the evening course. In addition there were 127 certificates for work in the evening school. The medal of the New England Cotton Manufacturers' Association was awarded to Thomas W. Williamson.

The Distribution of Wealth.

In the year that ended on April 5, 1904, there were, according to a return prepared by the Treasury, 19 persons in Great Britain with an income of over £50,000 a year. The aggregate income of these 19 persons was £1,968,442, or an average of just over £100,000 each. At the other end of the scale there were 131,956 persons whose incomes did not exceed £160 a year, but who were not exempt from the payment of income tax. Their aggregate incomes amounted to £11,930,867, or an average of about £90 each. Then 140,154 persons returned themselves as receiving over £160 a year, but less than £200, while 219 persons possessed incomes of over £10,000, and less than £50,000 a year. The incomes of 113 firms exceeded £50,000 a year, as also did those of 794 public companies and 45 municipal corporations and other local authorities. The total number of persons assessed for income tax was 451,323, and the gross amount of income assessed was £123,592,622. The 56,865 firms who made returns admitted a gross income of £87,225,616, while the gross income of 29,162 public companies amounted to £238,984,107. In Ireland not a single income of over £50,000 a year was returned, but 28 public companies were assessed on incomes exceeding that sum.—The Manchester Guardian.

The Crocker-Wheeler Company of Ampere, N. J., recently shipped direct to San Francisco a carload of their celebrated Form L Motors, ranging in outputs from 1/4 to 3 H. P., to be used in the rebuilding of San Francisco. These motors are being sold from the company's temporary office at 2611 Broadway, by H. C. Baker, manager in the San Francisco territory, who gives his personal attention to all propositions. The company are now building at their plant at Ampere, N. J., the fourth or last of the 4000 K. W. alternators ordered by the California Gas & Electric Corporation. Three of these machines installed in the suburb of San Francisco successfully weathered the recent disaster.

A San Francisco Knitting Mill Escapes Injury.

Gantner & Mattern Company, Manufacturers of Knitted Underwear.

San Francisco, May 26, 1906.

The Textile World Record, Boston, Mass.

Gentlemen: Thinking that you would be interested, we herewith report that our knitting mill has escaped destruction by the fire and is entirely uninjured by the earthquake that recently visited our city. We have been running our plant to its full capacity since May 7. Our retail store and wholesale department were consumed by the fire.

The city is rapidly resuming its former activity; numerous one-story buildings are being put up as salesrooms for the wholesalers, and warehouses are being put up on the outskirts of the city for their stock. The principal retail stores are all having buildings erected and some are already doing business; others will be in shape for regular business within the next 30 days. San Francisco will positively be greater than ever before, and the future of our citizens and all others who may favor us with their presence and capital will certainly bear rich harvests.

Yours very truly,

Gantner & Mattern Co.,
per G. A. Mattern, Mgr.

Like other manufacturing plants, textile mills are generally adopting mechanical draft as a substitute for the chimney. A recent installation of this character has been made in the power station of the Highland Park Mfg. Co., at Charlotte, N. C. A Sturtevant induced draft system is employed, the fans being located at floor level at one end of the battery of boilers. This apparatus comprises two 10-foot fans, each driven by a direct-connected 8 by 10 Sturtevant engine. The steel plate stack, which is 6 feet in diameter, extends only 12 feet above the roof.

Wool Market in California.

We have received the following from the Stockton (Cal.) Chamber of Commerce with a request that we publish it:

As a result of the recent disaster in San Francisco Stockton has temporarily become the wool market of California, and it is not improbable that it will continue to be for some time to come. Stockton is a freight terminal on two trans-continental railway lines and on navigable water; it is centrally located as regards the source of wool supply; it has warehouse facilities at low rent and its banking facilities are ample. It was these points that determined the question of location of the new wool market.

The leading grading, packing and scouring firm of the state was the first to move to Stockton. This was followed by such well-known buyers as S. Koshland & Co., E. H. Tryon, C. S. Moses, P. B. Findlay & Co., Santana & Perry, Dickens & Kearn, all of whom have opened offices in the neighborhood of the wool warehouses. Within thirty days after the San Francisco disaster Stockton thus became the wool market of California. Within this time 7,000 bags of wool, weighing over two million pounds, and being about one-fourth of the spring clip, was in warehouse and the work of grading, packing and scouring was well under way.

It is estimated that at least 15,000 bags of wool, valued at nearly one million dollars, will be handled through Stockton this spring. This industry, in all its branches, is giving employment to between sixty and seventy-five hands. Today, the State's new wool market is one of the busiest of Stockton's many industries.

Low Wages in Germany.

Questions relating to the improvement of the conditions connected with home industries in Germany are being eagerly discussed. A commission of inquiry, appointed by the King of Saxony, has recently published its report. The industries in which the conditions are the worst are passamenterie, lace, artificial flowers and toys. Among the passamenterie workers the highest possible earnings seem to be 8 cents an hour, and the average only 4 cents in American money. The lace workers, who earn 10 pfennigs (100 pfennigs are equal to 25 cents) consider that good, but 2 and 3 pfennigs are not unusual. In the town of Pirna women are making artificial flowers for 4 1/2 pfennigs an hour, and in the toy industry an hour's work is paid with 5 1/2 pfennigs. In a vast number of cases the workroom serves as kitchen and bedroom as well, and the low rate of pay obliges parents to insist on their children's assistance. Ninety hours a week are not unusual for adults, and for children sixty to sixty-six hours.—The London Telegraph.

The Sandusky Portland Cement Co. have placed orders with the Crocker-Wheeler Company of Ampere, N. J., for two engine types, 750 K. W., 400 volt, alternating current generators, and two engine type, 125 K. W., 125 volt, direct current generators to furnish light and power for driving their cement machinery at their new plant at Dixon, Ill.

Trade with France and Belgium in Textile Machinery.

Lille is the most important centre for this trade, Roubaix, Tourcoing and Armentieres touching its gates, and Ghent, Alost and other Belgian manufacturing towns being near. Lille is also midway between Normandy and the Vosges.

W. F. Suttill, a Manchester man, perceived the fact that Lille was the best strategical point for keeping in touch with the main textile districts of France and Belgium, so when establishing himself as a textile machinery merchant, twenty years ago, he made Lille his headquarters. This enables him with the assistance of several practical men to cover the ground thoroughly.

Mr. Suttill is sole agent for France and Belgium of some of the principal cotton machinists and engineers of Manchester and Oldham, but as the boom in the English cotton trade will cause a great part of their production to be absorbed for some time to come, he has determined to utilize this respite in introducing into France and Belgium a few approved American novelties in textile apparatus, particularly in connection with cotton spinning and doubling.

Builders of such machinery may be interested in investigating this opportunity to secure a new outlet for their manufactures.

How it is Done in Russia.

Lodz, Russian Poland, May 20.—The owners of the ribbon factories of Lodz met last night at Schmidt & Weichert's works to consider the strike situation. A crowd of strikers surrounded the factory, shut the doors of the building and held the manufacturers until they agreed to an advance in wages and to pay for five weeks of idleness.

The concession was made only after the manufacturers had suffered five hours' imprisonment and had been threatened with death if they refused.

New Generators for the Crawford Electric Light Plant.

The Crawford Electric Light Co. of Crawford, Neb., has recently ordered from the Crocker-Wheeler Company, of Ampere, N. J., two alternating current generators of 120 and 60 KVA respectively. Both generators of 2,300 volts. This increased capacity is for lighting the city streets, etc., in addition to their present electrical equipment.

Mill Problems in Bengal.

All through the year the wild jackal may be found frequenting the mill; during the monsoon, venemous snakes join company. The lives of these unwelcome visitors are generally spared in Mahesh, the village in which these mills stand—no doubt in deference to the God of Dissolution, the God who has living snakes for his necklace. Happily the superintendent of the mill—a pious Hindu—is not superstitious, and has provided facilities and rewards for the destruction of the reptiles found on the mill premises.—The Indian Textile Journal.

A Sign with a Meaning.

Of the many attractive and sightly signs of various sorts on new buildings along Broadway none is handsomer, more dignified, nor more of a credit to the concern it advertises than the new and beautiful bronze medallions that have been

placed on the new building at the old "Willcox & Gibbs Corner" of Broadway and Bond streets. These medallions strike us, as the sewing machines of this company have always done, as being decidedly up to the mark. They are 34 inches in diameter, artistic and clean cut, and so placed that "he who runs may read." In forming the unique monogram design in the center four crossed needles and a Willcox & Gibbs machine head give a very clever semblance of the initials W. & G. In fact, this form, as shown in the illustration, has been the trade-mark of the Willcox & Gibbs Sewing Machine Co. for 35 years and will be found on every one of the machines made by them. In this age of many trade-marks of good and indifferent designs we doubt if the present medallions will escape the eye of any passerby, surely not of anyone at all observant of things meritorious or out of the ordinary.

The "Nevershrink" Process.

A comparison of untreated wool with wool treated by the "Nevershrink" process, controlled by Chas. H. Heyer, Real Estate Bldg., Philadelphia, is said to disclose the interesting fact that the scales on the treated fibre are in exactly the same condition as those on the untreated fibre. This is apparently in conflict with the generally accepted theory that the fulling process results from an interlocking of the scales on the wool fibres. One writer has said that to make wool unshrinkable it would be necessary to remove the scales, but their remaining unchanged on the fibre treated by the "Nevershrink" process, together with the unshrinkable qualities of this treated fibre, make some further explanation in order. It is said that the "Nevershrink" process leaves the strength of the fibres unimpaired; in fact, that the treated fibre is actually stronger than the untreated fibre. Another advantage of this process is that the elasticity of the fibre remains unchanged.

An indication of the merits of the "Nevershrink" process is found in its extensive use in the United States and Canada as well as in Europe.

The " New Mayo" Full Automatic Knitter.

This machine, built by the Geo. D. Mayo Machine Co. at Laconia, N. H., has had such an extremely large and increasing sale since its introduction about three years ago, that the company have been obliged to increase their plant and output. They now occupy the entire Casino Square building, having a floor space of 24,000 square feet, and have a thoroughly equipped plant of the best modern machinery and tools, with a capacity for turning out 125 machines a month.

A branch office and show room are maintained at 56 North Sixth street, corner Arch, Philadelphia, Pa., where their machines can be seen in operation, and where a full supply of needles, parts, etc., are kept for the convenience of the trade in that section. It is in charge of B. M. Denney, the veteran knitting machine builder, with competent assistants and operators. Manufacturers when visiting the city are cordially invited to call.

They report business as very satisfactory, and have orders on their books sufficient to keep their plant running to its full capacity for many months.

It is the policy of this company to spare no expense or effort to improve their machines and satisfy their customers. They will be pleased to send a machine on approval to any responsible firms who are in the market for a number, being confident that its simplicity, durability, superior production and reasonable price will commend it to all after an impartial trial.

Forge Equipment.

The Buffalo Forge Company have their factory well filled with orders for new forge shop equipments to be installed this summer by numerous large manufacturing concerns and several manual training schools. Among the most recent are large equipments for the Midvale Steel Co. and the Lynn works of the General Electric Co.; also for the Calumet High and Manual Training School, Calumet, Mich., and the Indiana Reformatory, Jeffersonville, Ind.

New Lines of Business.

Chas. F. Chase, who is well and widely known in the textile trade, has considerably widened the scope of his business by adding several new lines. He has recently taken the agency for the Middle States for the Lawrence Pump & Engine Company of Lawrence, Mass. Mr. Chase will be much pleased either to call in person or give any information that may be desired regarding these centrifugal pumps.

Another new connection which he has recently made is that of Eastern and Canadian manager for Clark's Flexible Metallic Packing Co. Mr. Chase has regular established offices at Boston, Philadelphia and New York.

The Oneida Cotton Mills, Graham, N. C., are installing a complete slasher ventilating apparatus consisting of a Sturtevant exhauster, galvanized iron pipe, hoods, etc.

Announcement.

Paxton & O'Neill, the well known builders of knitting machinery, who for many years were located at 129 Broad St., Phila., announce to the knitting trade that they are now established in their new location on Third St., below Greene, where with their increased space and facilities they are better able than ever to fill the wants of the knitting trade for machines of this kind. They have on exhibition one of their latest machines for the manufacture of lace hosiery and invite manufacturers who are contemplating increasing their production or others looking into the knitting business to give them a call at their new address for the purpose of looking over the different lines of knitting machines manufactured by them.

The "Neverslip" Cop Spindle.

Imitation is the sincerest form of flattery, and the American Textile Specialty Machinery Co., 363 Rider Ave., New York, consider that no higher compliment could be paid to the merits of the "Neverslip" cop spindle than to have the name imitated in order that buyers may be interested in another device to accomplish the object so well attained by the "Neverslip" spindle and tube. The "Neverslip" spindle is well named and the device is so simple and effective that its merits are apparent to anyone with any practical knowledge of weaving. When the spindle projects from the shuttle it contracts so as to allow the tube to slip easily into it. The act of pressing the cop into the shuttle expands the spindle and brings the pressure on the inside of the tube, holding it firmly and preventing any possibility of its slipping from the spindle during weaving.

It is so simple and effective as to prompt the inquiry made concerning most great inventions, Why was it not thought of before? Strange to say, however, it was not thought of before and in fact inventors for years have tried to accomplish the same object by other means. With the best of previous devices the result was that in many cases the cop stuck so firmly in the spindle as to necessitate it being cut off with a knife, destroying the cop and losing much time by the operation. All this is obviated with the simple device used with the "Neverslip" spindle, which contracts the spindle as it is sprung from the shuttle and expands it as it is sprung back into the shuttle. The "Neverslip" spindle has now been in use for several years so that the makers can refer inquirers to the record of its use under working conditions. It has enabled long cops from eight to nine inches in length to be used successfully on cotton, woolen and worsted yarn. This was impossible before the advent of the "Neverslip" spindle. The advantages of using such long cops are so obvious as hardly to need mention here. There are increased production and decreased waste, both of which are important items in mill economy. There is the additional advantage that the loom can be run at a much higher speed with the "Neverslip" spindle than under the old system.

The term "Neverslip" as applied to cop spindles and tubes has been copyrighted and is now the registered trademark of the American Textile Specialty Machinery Co., which is prepared to protect its rights to the full extent of the law. The company advise us that while they appreciate the compliment paid to their spindle and tube by the imitation of the copyrighted name they are unwilling quietly to permit the imitation to continue. They are confident that manufacturers will quickly perceive the merits of the "Neverslip" system, which depends for its efficiency on the expansion of the smooth spindle instead of depending on the corrugations in the spindle to hold the tube in place.

The English Language.

Consul-General Church Howe, writing from Antwerp, says:

The fact that nearly one-half of the shipping traffic to and from Antwerp is carried on under the British and American flags has made Antwerp almost an English-speaking port. The authorities are awake to the fact, and are encouraging the study of the English language in all the classes of society. Free night schools for exclusive classes in English, organized by the city authorities, are attended by thousands of pupils, while special attention is paid to the study of English in all the grades of the day schools, public as well as private. The necessity of acquiring a practical knowledge of English is so generally felt that private initiative has seconded the efforts of the educational authorities, and clubs composed of clerks and employes of the business houses, banks, etc., have been formed, known as "Mutual English Teaching Clubs," the influence of which is spreading rapidly. The members of these clubs, in their strenuous efforts to master the commercial language of the world, are showing an unusual energy and determination.

This desire to popularize the English language is not confined to Belgium, but has extended to Germany as well, where recent orders of the Government require the officials and employes of the railroads to learn and speak the English language. Schools of instructions for this purpose have already been established at Munich and Nurenberg by the German Government. There is no denying the fact that the English language is fast becoming at all trade centres in western Europe the international commercial medium.

Operatives Desert the Mill to Attend a Revival Meeting.

Huntsville, Ala., May 3.—An unique "shutdown" of a cotton mill took place here yesterday as a result of the great Culpepper-Connelly revival being held in Huntsville. The Huntsville cotton mills, which employ about 300 operatives, had to close down for want of hands to operate their machinery. Superintendent D. B. Hazel, in speaking of the cause of the shutdown, said that his hands, he supposed, had to go to meeting in the day time as well as at night. The mill resumed operation the following day, and is now getting along all right. The revival is progressing splendidly and will continue probably ten days longer. About 200 people have been converted so far.—Birmingham Ledger.

A New Test for English Flake Graphite.

(Made by Prof. Goss of Purdue University.)

In considering the manner in which the graphite under test should be applied to lubricate the rubbing surfaces of the testing machine, it was deemed desirable to use as light an oil as was available, as by so doing but little lubricating effect would be realized from the vehicle and the maximum service would be secured from the graphite. An attempt to use water proved unsatisfactory because of the tendency of the rubbing surfaces to corrode under its influence, and kerosene was finally adopted as the most convenient and the most satisfactory. Throughout the test the lubricant employed has been either kerosene, or mixtures of kerosene and Dixon's flake graphite.

Before attempting any work with graphite the value of the vehicle was first determined. That this might be done, the machine was operated under kerosene lubrication for a considerable period, the pressure between the rubbing surfaces being gradually increased as they became more worn in service, the effect of the process upon the co-efficient of friction being noted. This process of wearing down rubbing surfaces in the presence of kerosene involved more than 600,000 revolutions of the test machine. The heaviest pressure that could be sustained by the rubbing surfaces under this lubrication was fifty pounds per square inch of surface, and the lowest co-efficient of friction developed was .00547. This record was accepted as representing the performance of kerosene as a lubricant.

After the 633,287 revolutions involved by the process described in the preceding paragraph, a mixture, by weight, of two parts kerosene and one part Dixon's flake graphite was made. This mixture had the consistency of thin paste when stirred, but the flakes of graphite quickly settled when permitted to stand at rest. The immediate effect of applying this mixture as a lubricant was to increase the co-efficient of friction, but this in its maximum effect was momentary. Without change or any modification of the lubricating mixture, the co-efficient of friction rapidly fell, first to the value given by the kerosene alone, and then to still lower limits, so that after 10,000 revolutions, occupying a period of something less than thirty minutes, the co-efficient of friction, under the influence of the mixture of kerosene and graphite, became 83.9 per cent. of that obtained from the use of kerosene alone. Conditions thus secured were continued during more than 400,000 revolutions of the test machine, for the purpose of determining beyond doubt the minimum co-efficient of friction under the conditions stated. Subsequently the pressure between the rubbing surfaces was increased by increments of ten pounds, until a maximum of 110 pounds per square inch had been secured. Beyond this limit lubrication failed. The observations show that as the pressure was increased, the co-efficient of the friction diminished, the minimum value being .00296. The immediate effect, therefore, of adding Dixon's flake graphite to the kerosene was to permit an increase of load from 50 to 110 pounds per square inch, or 120 per cent., and a reduction in the co-efficient of friction of 45.9 per cent.

Having secured these results it was next sought to ascertain the endurance of the graphite as a lubricant. This was done by removing all graphite from the machine and by rinsing all parts involved, including the rubbing surfaces, with kerosene, after which the machine was operated under a pressure of 100 pounds per square inch in the presence of the kerosene alone. Under these conditions the lubrication was aided by such particles of flake graphite as naturally adhered to the rubbing surfaces. It was expected that these particles of flake graphite would sooner or later disappear and that the conditions would return to those originally found for the kerosene alone. Each morning the rubbing surfaces were removed from the machine and all parts carefully rinsed for any particles of graphite, and the work of the day proceeded, usually to the extent of 150,000 revolutions. After eight days' running and 978,000 revolutions, no diminution in effect could be discovered. Both the capacity of the bearing and the co-efficient of friction developed remained unchanged. A microscopic inspection of the surfaces showed the presence of flake graphite on them. Whether the amount was sufficient to account for the results obtained, or whether in the earlier stages the presence of the graphite served to control the finishing of the metallic surfaces to permit them to give highly satisfactory results, are questions that cannot be determined. The probability is, however, that without the graphite these results would not have been secured.

German Colonial Cotton.

The steps taken and the progress made in the development of cotton production by the German government have assumed such importance that they merit a place in review of industrial subjects. There can no longer be a doubt that there is a united and determined effort on the part of German manufacturers of cotton goods to devise some means of becoming independent of the American cotton supply.

The gambling fluctuation in raw cotton is so great, and the speculative manipulation has injected such an element of uncertainty to the manufacture, that the agitation seems to be general in Europe to devise some way of independence from what is termed the "intolerable yoke of the American speculator." Besides a united and concerted movement on the part of manufacturers, the Governments are lending substantial support and encouragement to the every effort in this direction. Never was the advantage of the United States as a controller of the world's cotton emphasized as in the pending tariff difficulty with Germany. In the event of a tariff war there are few of the manufactured products the United States now buys from Germany that cannot be bought from England and France. On the other hand, Germany must buy upward of $110,000,000 of raw cotton from the United States or close down her great mills. The disadvantage is too great not to be appreciated.—Consul Pike, Zittau.

The Saco and Pettee Machine Shops, Newton Upper Falls, Mass., have received an order for drawing frames and roving frames from the Sibley Mfg. Company, Augusta, Ga.

Electric Fans.

The economic value of good engineering is strongly emphasized by an instance that has recently been brought to our attention. The B. F. Sturtevant Co., of Boston, Mass., submitted in competition with other blower manufacturers an estimate for certain electric fans of its own manufacture and according to its usual practice carefully designed the same together with the piping system in order to accomplish the desired results with the least expenditure of power. To this end large slow running fans were planned and the relative air velocities at all points were carefully regulated.

Owing to the large size of the apparatus the Sturtevant price was fully $500 above the highest of the other bids, but to impress upon the purchaser the economic value of such an equipment the B. F. Sturtevant Co. enforced its logic by guaranteeing that the power required would not exceed 15 h. p., and agreed to forfeit $100 per h. p. for any excess above this, provided it received a bonus of $50 per h. p. for any reduction below the amount specified. The lowest priced arrangement submitted by its competitors was at first stated by them to require 50 h. p., a statement which, with evident purpose, was subsequently reduced to 25 h. p. The Sturtevant apparatus was purchased under the conditions of the guarantee and to the credit of the Sturtevant Co., who allowed a sufficient margin in their calculations to insure the receipt of a bonus, the trial test indicated an actual power expenditure of only 10.5 h. p., thus calling for a bonus of $225. This was gladly paid by the purchasers with the satisfaction of knowing that, although the first cost was greater than might have been incurred if a competitor's design had been accepted, the power was 58 per cent. less. That is to say, an excess of $725 had been paid, but a constant saving of 14.5 h. p. was insured. Upon a basis of $50 per h. p. per year the excess payment will be made good by the saving in one year's operating expense.

While such cases are presented in many lines of manufacture and installation, they are peculiarly characteristic of blower practice, where the manufacturer is sometimes tempted to secure the order at a low price by making the apparatus as small as possible, regardless of the excessive power that may be required to drive it. There is a satisfaction, however, in noting that some purchasers are sufficiently far sighted to see the advantage of a greater original outlay if a subsequent saving in operating expense can be secured.

Resorts for the Vacationist.

The Boston & Maine Railroad has published a handsomely illustrated booklet containing a list of the hotels and boarding houses in the summer playground reached by its lines, with stage and steamer connections. It describes the different resorts, gives the names of the hotels with the accommodations and rate per day and per week. It is a booklet that ought to be in the hands of any one who is planning a summer vacation and may be had upon application at the Passenger Department, Boston & Maine Railroad, Boston, Mass.

Grease as a Lubricant.

In reply to a query, "Why do you claim animal grease is superior to mineral grease for general lubricating purposes?" Adam Cook s Sons, No. 313 West Street, New York, N. Y., say:

"Albany grease, for the reason that it is a purely animal grease, free from all destructive acids, will lubricate and preserve the bearings of machinery better than any of the so-called mineral greases on the market today, as it has done for nearly forty years. Having comparatively low melting points for the different consistencies, it will more readily melt, and thus lubricate, cool and preserve a bearing that from carelessness, inattention or the improper placing or setting of cups would otherwise burn or cut out and be practically destroyed by the use of mineral greases with high melting points.

"Take, for instance, a mineral grease with a melting point of 300 degrees (and most of those on the market today range in that neighborhood, with some running as high as 600 degrees) and place it in open box-bearing caps the usual result is that the bearing will get hot, almost to the melting point of the grease before it will flow over the bearing and lubricate it. This is getting pretty close to the danger point for babbitted bearings, and if the heating be long continued will destroy them. Besides if the bearings should be neglected for a short time and not supplied with grease, a burned out bearing or a fire will be the inevitable result. Under the same circumstances, No. XXX Albany grease, which is of the hardest consistency made, with the highest melting point, 175 degrees, would melt and flow over the bearing, lubricating and cooling it, on account of its peculiar properties, long before the heat of the bearing had reached the danger point.

"Mineral greases, to be used with any degree of satisfaction, and by that we mean cool bearings, must be used in compression cups of either the spring or hand type. They cannot be used with good results in spindle cups. On the contrary, Albany grease will give the best results and the greatest economy when used in spindle cups, and on any speed, and when the simple precautions advised are observed. When used in those cups the bearings are cool, the copper feed wire in the spindle cup getting warm only through its contact with the shaft, and by this means melting only as much grease as is necessary to lubricate the bearing, thus keeping it cool. Mineral grease cannot be used, because its melting point is too high. We claim Albany grease can be used in any style grease cup on the market today with better results than mineral greases, because so much less of it is required to do the same work, keeping the bearings cool at the same time, hence the economy."

Frank Rivers, Fall River, Mass., deals in all grades of cotton waste, making a specialty of the higher grades for woolen knit goods and carpet yarns and other manufactures, such as Peeler, Egyptian and Sea Island Combers.

Ludwig Littauer.

Ludwig Littauer succeeds to the business of Moeller & Littauer at 109 Greene Street, New York, importers and dealers in all kinds of yarn, making a specialty of fancy yarns, artificial silks, polished threads and tinsels.

Infringement Suit.

The Wildman Manufacturing Company of Norristown, Pa., has recently entered suit against the Ruth Machine Company of York for infringements on patents covering stop motions and ribber machines.

Recent Textile Patents.

BALE TIE Machine. 819,925. Archibald E. Rhoades, Elk Grove, Cal.

CLOTH PRESSING Machine. 820,681. Lawrence Svoboda and Jaroslav Kudrle, Chicago, Ill.

CLOTH PRESSING Machine. 818,753. Jacob Ecker, Chicago, Ill.

CLOTH TENTERING Machine. 820,746. Charles L. Taylor, Hartford, Conn.

COMBING MACHINE Gill Box. Wool. 818,707. Seth Ormondroyd and John F. White, Bradford, England.

COTTON GIN. 819,893. Phineas F. King, Cleveland, O.

COTTON GINNING. 821,423. Geo. A. Lowrey, Chicago, Ill., assignor to Planters Compress Co.

DYEING APPARATUS. 820,654. Henri L'Huillier, Paris, France.

FABRIC FOLDING Machine. Woven. 819,991. Moritz A. Gutte, Reichenau, Germany.

FABRICS. Machine for Extracting Threads from. 819,010. Hermann C. Fischer, Vienna, Austria.

FABRICS. Ornamenting Pile. 819,412. Oswyn St. Leger Davies, Castleton, England.

FIBRE CLEANING Machine. 821,571. Wm. A. Adams, Winchester, Ky.

FIBRE REDUCING Machine. 821,448. Herman S. Albrecht, St. Louis, Mo.

LOOM HARNESS Controlling Mechanism. 818,743. Patrick Cassidy and Aime St. Laurent, Salem, Mass., assignors to Draper Co., Hopedale, Mass.

LOOM. 821,600. Patrick E. Victory, Mannville, R. I.

LOOMS. Filling Exhaustion Indicating Mechanism for. 821,123. Chas. F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS. Jacquard for Weaving. 819,567. Harry Mackintosh, Shipley, England.

LOOM MULTIPLIER Mechanism. 821,321. Thos. P. Walsh, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM. Needle. 819,138. Eduard Herzig, Union Hill, N. J.

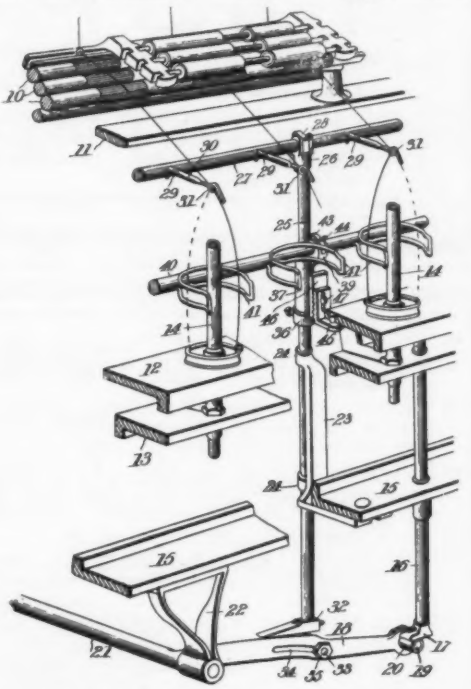
LOOM PICKER Sticks. Lug Strap Fastener for. 821,058. Geo. E. Prescott, Skowhegan, Me.

LOOM SELVAGE Attachment. 819,420. Theodore Garisio, Bethlehem, Pa.

LOOM SHUTTLE Binder Holding Device. 819,912. Benjamin F. McGuiness, Worcester.

SPINNING MACHINES. Separator Attachment for Ring. 819,496. Andrew C. Allgood, Henderson, N. C.

This invention relates to that class of spinning and twisting frames in which a vertical movement in relation to the spindles is imparted to the ring-rail, and particularly relates to improvements



whereby the thread-guides and the separators follow the movements of the ring-rail.

The object is to provide a simple and cheap separator and one which will prevent any possibility of the yarn ballooning, even with a very long traverse and high speed.

A further object is to provide a structure in which the number of parts used is reduced to the minimum and having no parts that are liable to break or get out of order, as is frequently the case with the blade type of separator, and at the same time furnishing all or more of the conveniences than are obtained with the blade-separator.

LOOM SHUTTLE Box Motion. 820,018. Eppa H. Ryon, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM SHUTTLE Check and Lock. 820,589. Francis A. Mills, Lawrence, Mass., assignor of one-half to Grosvenor B. Emmons, Methuen, Mass.

LOOM SHUTTLE Checking Means. 820,663. Francis A. Mills, Lawrence, Mass., assignor of one-half to Grosvenor B. Emmons, Methuen, Mass.

LOOM SHUTTLE Lock. 820,662. Francis A. Mills, Lawrence, Mass., assignor of one-half to Grosvenor B. Emmons, Methuen, Mass.

LOOM STOP Motion. 12,481. Joseph Coldwell and Christopher G. Gildard, South Swansea, Mass., assignors to the Goldwell-Gildard Co.

LOOMS. Thread Parting Mechanism for. 819,351. Herbert F. Kelley, Lewiston, Me., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Tensioning Means. 819,742. William F. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

PILE FABRIC. Woven. 820,003. Walter V. Lowe, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

SPINNING APPARATUS. Rotary Ring. 820,628. George O. Draper and Clarence E. Metcalf, Hopedale, Mass., assignors to Draper Co., Hopedale, Mass.

SPINNING MACHINE. 819,298. Joseph W. Martin, Holyoke, Mass.

SPINNING MACHINE. 821,013. Frank A. Breeze, Forest Mills, Canada.

SPINNING RINGS. Making. 819,340. James R. Coe, Ansonia, Conn.

SPINNING and Twisting Apparatus. Ring. 821,328. Joel Hayden, Jr., Boston, Mass., assignor to Hayden Mchy. Co.

SPINNING or Twisting Apparatus. 820,659. Clarence E. Metcalf, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

SPINNING or Twisting Apparatus. Ring. 820,629. George O. Draper and Clarence E. Metcalf, Hopedale, Mass., assignors to Draper Co., Hopedale, Mass.

SPINNING and Twisting Machine Bands. Machine for Making. 819,848. Mims S. Burdette, Greenville, S. C.

TEXTILE ARTICLE Provided with Lappet Figures and Producing the Same. 820,602. William A. Robinson, Woonsocket, R. I., assignor to Mannville Co., Providence, R. I.

WOVEN FABRIC. 820,515. George C. Moore, Revere, Mass.

WOVEN FABRIC. 821,441. Wm. M. Stevenson, Indian Orchard, Mass., assignor to Hodges Fibre Carpet Co.

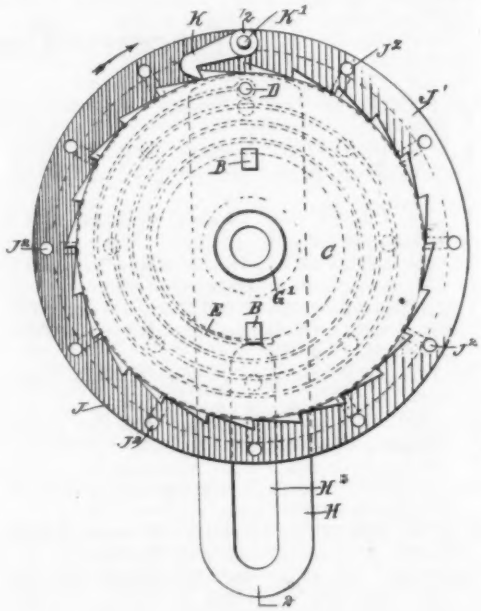
WARPER COMB. 817,093. Alonzo E. Rhoades, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

WOVEN FABRIC. Elastic. 817,019. Harry T. Sykes, London, England.

WOVEN FABRIC. 820,994. Harry W. Smith, North Grafton, Mass.

WARP BEAMS. Tension Device for. 818,829. Gottlieb Keller, New York, N. Y., assignor to Keller Machine Co.

The object of the present invention is to provide a new and improved tension device for warp-beams or warp-carrying spools arranged to permit minute and convenient regulation for producing



the desired tension on the warp, according to the nature thereof, and to provide a long range of movement of the beam.

The invention consists of novel features and parts and combinations of the same.

One end of the warp-beam, A, is engaged by studs, B, projecting from the rear face of a wheel, C, preferably in the form of a ratchet-wheel and provided with a transverse pin, D, engaging the outer end of a spiral spring, E, fastened with its inner end to a stud, F, projecting from the peripheral surface of a wheel, G, the hub, G', of which forms a bearing for one end of the shaft, A', of the warp-beam, A, the other end of the shaft being journaled in the usual manner in a suitable bearing on the frame of the loom. The hub, G', is journaled in a bearing on a bracket, H, held adjustable on one side, I, of the loom-frame by the use of a bolt, H', engaging the side, I, and extending through an elongated slot, H^3, formed in the bracket, H.

WATERPROOF FABRIC. 820,694. Lon A. Bond, Logansport, Ind., assignor to Rubbertex Cloth & Paper Co., Logansport, Ind.

WOOL. Detergent for Scouring. 818,648. Salo Wohle, London, England.

WOOL SCOURING Machine. 821,139. Joseph H. Tillinghast, Stockton, Cal.

WOVEN FABRIC. 820,825. Hovcep Sarafian, Yonkers, N. Y.

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PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN

SUSPENDED ON LINKS. REQUIRING NO EXPENSIVE FOUNDATIONS

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You know the friction load of a mill, the power to turn belts and shafting alone, is high, from 20-50 per cent. of your total load.

Half of this is from tight belts.

Cling-Surface permits every belt to be run easy and carry fullest loads and turns this half from overcoming friction to doing work.

Besides preserving the belts, saving oil, labor and fuel, and giving steady, even speed at machines.

It is a belt food — not a sticky dressing.

A trial order will prove it. Send for one.

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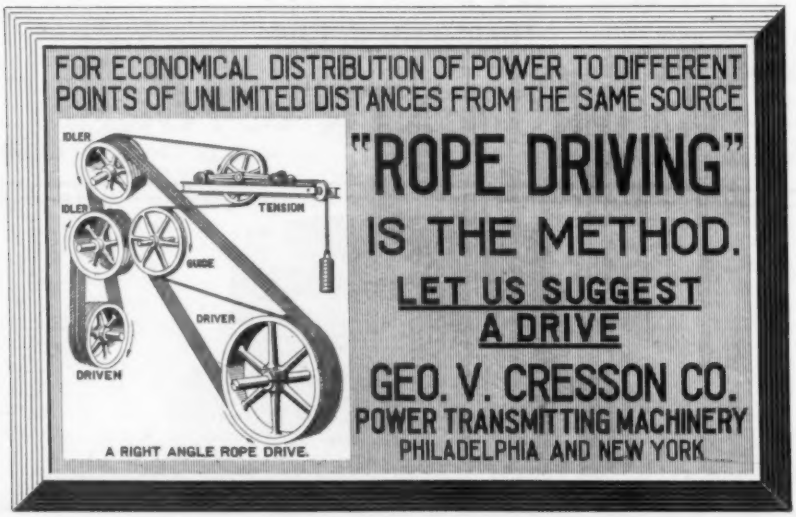
BULLETIN ON ESSENTIALS OF ROPE DRIVING



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The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

☞ Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accountants, Public.
Cathrall, W. M.

Acetylene Generators.
Wing, L. J., Mfg. Co.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.

Architects and Mill Engineers.
Dean & Main.
Ferguson, John W.

Asphalt Tanks.
Scaife, W. B., & Sons.

Auditors.
Cathrall, W. M.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S., & Son.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Woonsocket Machine & Press Co.

Balling Machine.
Torrance Mfg. Co.

Bandings.
—See under Yarns.

Baskets.
Lane, W. T., & Bro.
Morris & Co.

Belting.
Boston Belting Co.
Gandy Belting Co.
Main Belting Co.
Norwich Belt Mfg. Co.
Shultz Belting Co.
Turner, J. S., Mfg. Co.
—See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Shultz Belting Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Birdsboro Steel Foundry & Machine Co.

Bindings.
—See Tapes and Braids.

Bleaching Kiers.
Allen, Wm., Sons Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Roessler & Hasslacher Chemical Co.

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American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Mass. Fan Co.
New York Blower Co.
Philadelphia Drying Machinery Co.
Sterling Pipe & Blower Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbin Covers.
Kolb, Frank E.

Bobbin Machinery.
Defiance Machine Works.

Bobbins, Spools, Shuttles, Etc.
American Textile Specialty Mchy. Co.
Leigh, Evan A.
Tebbets, E. L., & Co.
Wilson & Co.

Boiler Inspection and Insurance.
—See Steam Boiler Insurance.

Boilers.
—See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
—See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
—See Tapes, Braids and Edgings.

Brass (Perforated).
—See under Perforated Metal.

Bridges.
Scaife, W. B., & Sons.

Brushers.
—See Napping Machines.

Brushes.
Felton, S. A., & Son Co.
Mason Brush Works.
Parks & Woolson Machine Co.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Burlaps.
International Button Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
Rice, Barton & Fales Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
—See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Birch Bros., Somerville Machine Wks.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.

Card Clothing.
Ashworth Bros.
Bowes, L. M., Co.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Carded Cotton.
Blaisdell, S., Jr., Company.
Indian Orchard Company.
Wonalancet Company.

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—See Automatic Feeds.

Card Grinding Machinery.
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Leigh, Evan A.
Riley, C. E., Company.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.

Case and Barrel Trucks.
Clark, The Geo. P., Co.

Castings.
Farrell Foundry and Machine Co.
Schofield, Wm., Co.

Cement Pans.
Scaife, W. B., & Sons.

Chain Blocks and Hoist.
Yale & Towne Mfg. Co.

Chemicals.
American Chemical Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little, Arthur D.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Smyth, J. L. N., Paper Co.

Cloth Cutting Machinery.
—See Cutting Machinery.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas, & Co.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Humphrey Machine Co.
Hunter, James, Machine Co.

Coal Handling Machinery.
Monongahela Mfg. Co.

Color Kettles.
Rice, Barton & Fales Machine & Iron Company.

Comb Aprons.
Turner, J. S., Mfg. Co.

Combs (Wool and Cotton).
Hood, R. H.
Leigh, Evan A.
Lowe, Stephen C.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Concrete Work and Construction.
Simpson Bros. Corporation.

Conveying Machinery and Chains.
Monongahela Mfg. Co.

Conveyors, Pneumatic.
—See Blowers & Blower Systems.

Cop Spindles.
American Textile Specialty Mchy. Co.

Cop Tubes.
American Textile Specialty Mchy. Co.
—See Paper Tubes.

Copper (Perforated).
—See under Perforated Metal.

Copper Print Rollers.
Rice, Barton & Fales Machine & Iron Company.
Rome Metal Co.
Taunton, New Bedford, Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.

Copper Work for Dyers.
Butterworth, H. W., & Sons Co.
Textile Finishing Machinery Co.

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Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E., Company.
Stoddard, Haserick, Richards Co.
Wonalancet Company.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
American Textile Appliances Co.
American Textile Specialty Mchy. Co.
American Drying Machinery Co.
Ashworth Bros.
Barker, James.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Hetherington, John, & Sons, Ltd.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kip-Armstrong Co.
Kitson Machine Co.
Leigh, Evan A.
Lowe, Stephen C.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Rice, Barton & Fales Co.
Riley, C. E., Company.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Smith & Furbush Machine Co.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Cameron, James A.
Eastman Machine Co.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Stafford, G. W., Mfg. Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Vacuum Process Co.

Dry Goods Trucks.
Clark, The Geo. P., Co.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Philadelphia Drying Machinery Co.
Sterling Blower & Pipe Mfg. Co.

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Davidson, J. F.
Fairhill Bleachery.
Fawell, Arthur.
Firth & Foster Co.
Greenwood, R., & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Providence Mills Mfg. Co.
Rowland, Samuel.

Dyeing, Drying, Bleaching and Finishing Machinery.
Alton Machine Co.
Allen, William, Sons Co.
American Blower Co.
American Drying Machinery Co.
American Dyeing Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Beaumont's Limited.
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Gessner, David.
Heathcote, John, & Son.
Hopkins Machine Works.
Hunt, Rodney, Machine Company.
Hunter, James, Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A., & Co.
Leigh, Evan A.
Leyland, Thos., & Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Rice, Barton & Fales Co.
Smith, Drum & Co.
Sirocco Engineering Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Trucks.
Clark, The Geo. P., Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Chemical Co.
American Dyewood Co.
Atteaux, F. E., & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Continental Color & Chemical Co.
Kalle & Co.
Ford, J. B., Co.
Fortner, L. B.
Geisenheimer & Co.
Johnson, Chas. A., & Co.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Metz, H. A., & Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F., & Co.
Thayer, Ed. M.
West Indies Chemical Works, Ltd.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
General Electric Co.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sterling Blower & Pipe Mfg. Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.
Wing, L. J., Mfg. Co.

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Sturtevant, B. F., Company.

Electric Lighting.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Yale & Towne Mfg. Co.

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General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.
Wing, L. J., Mfg. Co.

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Morse, Williams & Co.
Salem Elevator Works.

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Walther, Otto.

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Pettes & Randall Co.

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Consolidated Engine Stop Co.

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Moulton, P. A.

Engravers.
Smith Bros.

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Sterling Blower & Pipe Mfg. Co.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

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Philadelphia Water Purification Co.
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The Hungerford Filter Corp.

Feeds.
——See Automatic Feeds.

Felt Hardeners.
Farrell Foundry and Machine Co.

Felting Machinery.
Farrell Foundry and Machine Co.

Filters.
American Water Softener Co.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B., & Sons.
The Hungerford Filter Corp.

Finishing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.

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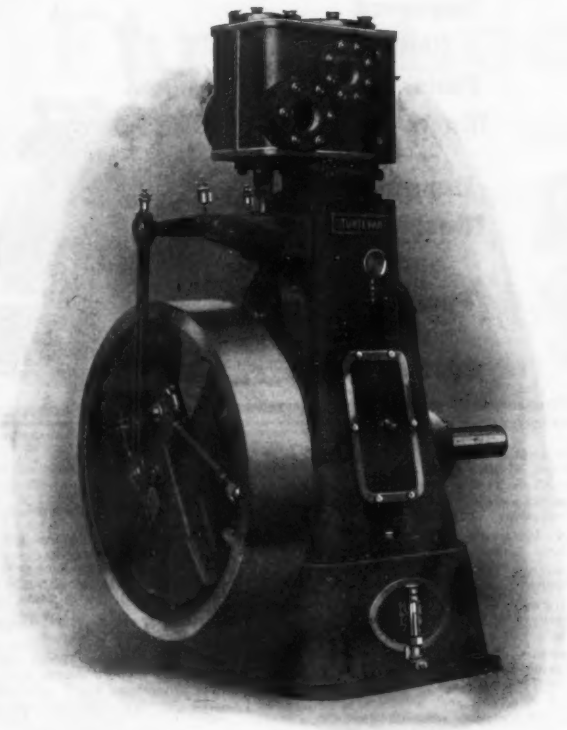
The Sturtevant Engine



Stands in a class by itself. It represents the highest standard yet obtained in a relatively small reciprocating engine. Forced lubrication insures continuous operation, the enclosing features prevent all escape of oil and the water-shed partition gives access to the piston rod stuffing box.

SEND FOR BULLETIN 125.

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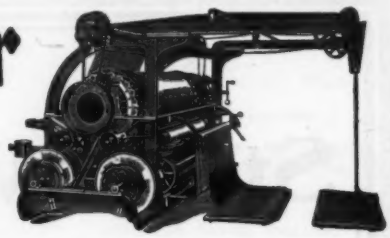
General Office and Works, Hyde Park, Mass.

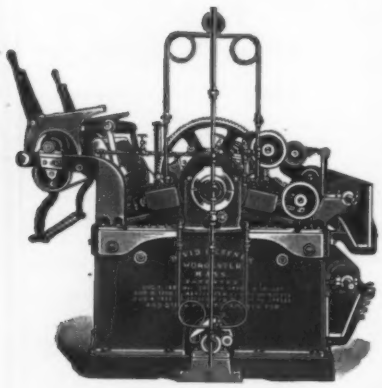
New York Philadelphia Chicago London

Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fans, Blowers and Exhausters; Steam Engines, Electric Motors and Generating Sets; Fuel Economizers; Forges, Exhaust Heads, Steam Traps, Etc. 575

David Gessner

Worcester, Mass.

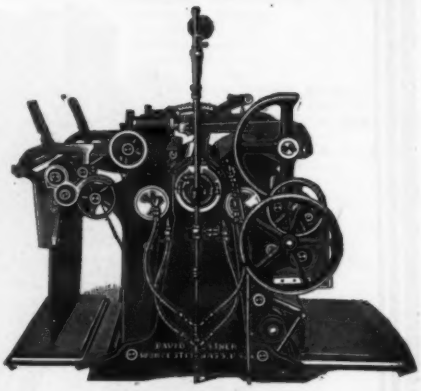




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Fire Extinguishers.
Badger, E. B., & Sons Co.

Fire Hose.
Boston Belting Co.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

Fire Pumps.
—See Pumps.

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Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Hopkins Machine Works.
Leigh, Evan A.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
Salvator Transfer, Inc.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.
Sturtevant, B. F., Co.

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Hunt, Rodney, Machine Co.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.

Garnetts.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.

Gassing Machines.
Stubbs, Joseph.

Gauges.
Crosby Steam Gage & Valve Co.
Walworth Manufacturing Co.

Gears.
Farrell Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrell Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

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Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W., & Co.

Grease.
Cook's, Adam, Son.

Heating.
—See Ventilating.

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Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Economy Engineering Co.
Yale & Towne Mfg. Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Beck, Charles, Paper Co.
Kaumagraph Company.

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American Moistening Co.
Bell Pure Air & Cooling Co.

Hydraulic Rams.
Power Specialty Co.

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American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Hunt, Rodney, Machine Company.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

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Sauquoit Silk Mfg. Co.

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Home Insurance Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John, & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Eastman Machine Co.
Hunt, Rodney, Machine Company.
Langston, Samuel M.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

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—— MANUFACTURERS OF ——

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For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

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Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Hilscher, G.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kinsey, Walter.
Koch, Edward W.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, Loyal T.
Jarrard Needle Company.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

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Leigh, Evan A.
Lowell Machine Shop.
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Allington & Curtis Mfg. Co.
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Malcolm Mills Co.
Montgomery, J. R., & Co.
New England Cotton Yarn Co.
Skerry, A. T., & Co.
Sternberg, Fred. & Co.

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SOUTHERN OFFICE, CHARLOTTE, N. C.

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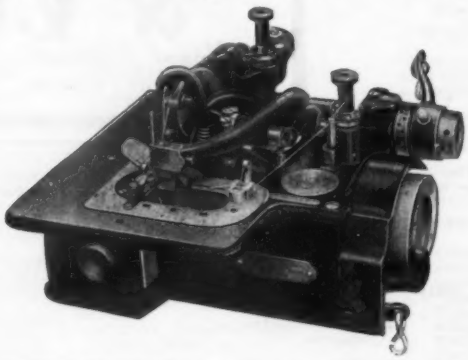

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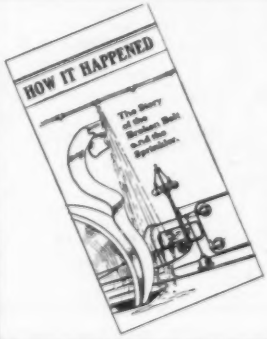

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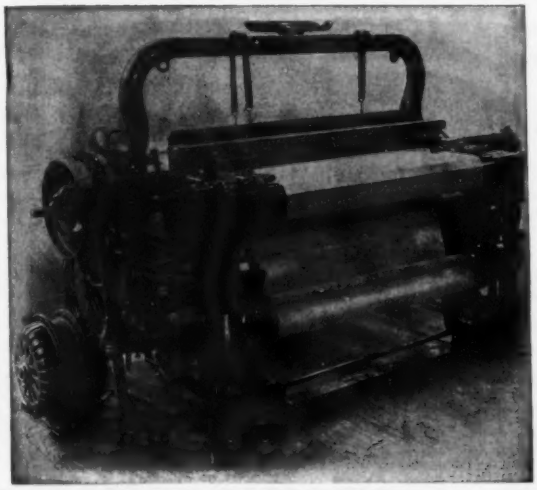

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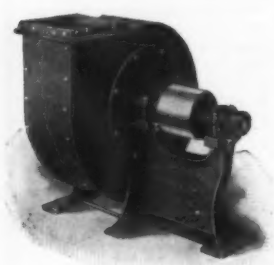

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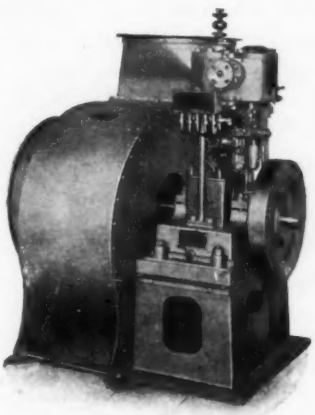

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A method of producing an imitation wool fibre from a well known and cheap vegetable fibre. The method is simple and cheap. The resulting fibre can be used to replace wool with advantage in the manufacture of Blankets, Rugs, Carpets, Felts, Kepp, etc., etc. The fibre can be dyed in any shade or tint or even for whites. Patterns and further particulars with pleasure. Apply to W. R. UJVARY, Eisenstuckstr, 361/Dresden-A., (Germany.)

Silk Mill Wanted.

Responsible parties are interested in acquiring a Broad Silk Plant of 100 looms or more; only such with up-to-date equipment considered. Large proportion of wide looms preferred. Strictest confidence assured. Address "Broad Silk Mill," care Textile World Record, Boston, Mass.

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Engines, Boilers, Pumps, Dynamos, Motors, Iron Pipe, Belting, Angle and Architectural Iron, Contractors' Supplies, bought, rented, sold and exchanged.

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Apron & Belting Butts, Worsted Comb & Gill Box Aprons. Mill Supplies, "Tau-Bo" Rawhide Picker Leather.

Tensile strength of Combination Tanned Belting is nearly 100 per cent. greater than best Oak Leather made. It is pliable and will transmit 50 per cent. more power; a 90 days free trial belt will prove this fact.

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Four, five section **KITSON WASTE BREAKING MACHINES,** for breaking up canvas, duck, yarn, etc. These machines are practically new, and in first-class condition, and can be seen running.

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Textile Machinery, New and Second Hand

Will buy Odd Lots of Yarn of Any Kind. Send Samples and Price.

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Two Moses Mellor Knitting Machines with two heads, each 35" diam., 6¼ needles to the inch.

One Blackburn Knitting Machine with two heads, 35" diam., 9 needles to the inch.

One Blackburn Knitting Machine with two heads, 35" diam., 10 needles to the inch.

One J. W. Hepworth & Co., Balmoral Knitting Machine, 30" diam., 56 feeds, 10 needles to the inch

Two J. W. Hepworth & Co. Balmoral Knitting Machines, 30" diam., 56 feeds, 16 needles to the inch.

Two Curtis & Marble Napping Machines, 66" wide.

Nine double rib Knitting Machines, 30" wide, 12 needles to the inch, 1 needle bar, 1 sinker bar, 3 guide bars with each machine (Wrightson Monitor).

Five double rib Knitting Machines, 30" wide, 12 needles to the inch, 1 needle bar, 1 sinker bar, 3 guide bars with each machine.

Address "Miscellaneous," care Textile World Record, Boston, Mass.

W. F. Suttill, Lille, France, Import House for Textile Apparatus. Sole Agent for France and Belgium, since 1886, of leading British Cotton Machinists, Expert in Ring Spinning and Doubling, **desires to introduce approved American Novelties. Highest references given and required.**

For Sale. 25 new Gilbert cotton looms. **Address Bethel Silk Co., Bethel, Conn.**

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MEN WANTED.

Same rates as Wants, For Sale, etc. Manufacturers will be furnished, without charge, with the names of suitable men who are entered on our list, and can usually supply their wants in this way.

WANTED.

Family help consisting of **Weaver and Spinners.**

Address: "Peerless," care of Textile World Record, Boston, Mass.

Wanted. First class jacquard designer for elastic and non elastic suspenders. Address, Jacquard, care Textile World Record, Boston, Mass.

Wanted. We are having calls for first-class superintendents and boss knitters for hosiery and underwear mills. For further information write to Overseer Bureau, Textile World Record, Boston, Mass.

Boss Dyer Wanted in braid factory who thoroughly understands dyeing cotton and imitation silk. Steady employment and good salary to right party. Address Braid Dyer, Textile World Record, Boston, Mass.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attention to this department. He would be pleased to hear from any of his friends who may be interested.

COTTON SUPERINTENDENTS.

Superintendent and Designer, or Designer. Young man, American, with 4 years' experience as designer. Worked on shirtings and all kinds of elastic and non-elastic webs, on Crompton and Knowles, broad and narrow looms. Will accept a good position anywhere in United States. 3359, Textile World Record, Boston.

Superintendent of Bleachery. Worked on all kinds of lawns, lenos and colored lawns, towels, colored and white ducks, drills, tickings, shirtings and hosiery. Familiar with all kinds of bleaching machinery; first-class references; 55 years of age. 3245, Textile World Record.

Superintendent and Designer wants position as manager. Experienced designer and practical man for the tie-up of looms for weaving ribbons, silk, upholstery and cotton goods, plain and jacquard cloths. 20 years' experience as manager and understands a mill in all its branches. Knows the coloring for stripes and figured upholstery, cotton, silk and ribbon novelties a special. 3423, Textile World Record, Boston.

Cotton Superintendent or assistant superintendent. Worked on linen and union towels and crashes. Father now taking full charge of the business, so he is not needed. Worked on Crompton & Knowles and other machinery used in toweling manufacture. Age 28; first-class reference. 1867, Textile World Record.

Superintendent of a Cotton Mill; 45 years of age; married; Scotch; familiar with fancy ginghams, denims, flannels, and all kinds of sheeting. Has first-class references. 3318, Textile World Record.

Agent or Superintendent, cotton or woolen mill. 53 years of age, American. Worked on men's wear, overcoatings, dress goods, plain cotton goods and fancy shirtings, most all kinds of woolen and cotton machinery. 3457, Textile World Record, Boston.

Superintendent of Bleaching and finishing works. Has experience on Nottingham, Irish point, bobbinet and renaissance curtains a specialty. Also Swiss dots, organdies, lace handkerchiefs, embroideries, etc. Thoroughly understands aetying, carbonizing and dyeing. A practical man, no experidesigner. Worked on shirting and all kinds of menter. 3443, Textile World Record, Boston.

WOOLEN SUPERINTENDENTS.

Supt. and Designer, or Asst. Supt. and Designer. Position wanted by a man of Scotch nationality, married. Is experienced on fancy worsteds, fine and medium, woolen and dress goods. Is familiar with all kinds of woolen machinery. Good references. 3587, Textile World Record.

Supt., Asst. Supt., or Overseer of Carding. Position wanted by a man 39 years of age, married, American. Is experienced on all kinds of cotton colored goods, long or short stock, also on bleached stock. Is familiar with Colvin, Whitin and Crompton looms, and all makes of carding and spinning machinery. Good references. 3585, Textile World Record.

Asst. Supt. or Overseer of Finishing. Position wanted by a man 44 years of age, married. Has worked on all kinds of woolen and worsted goods, high grade broadcloth, overcoatings, kerseys, beavers and dress goods. Is familiar with English, American and German machinery. Good references. 3575, Textile World Record.

Agent, or Supt. and Designer. Position wanted by a man 40 years of age, married and American. Is experienced on fancy worsteds, woolen kerseys, thibets, overcoatings and dress goods. Is familiar with all kinds of woolen machinery. Good references. 3574, Textile World Record.

Supt. of a Woolen Mill, or Designer. Position wanted by a man 53 years of age, German. Is experienced on all kinds of worsted, fancy and piece dyes, kerseys, beavers, flannels and robes. Is familiar with all makes of woolen machinery. Good references. 3583, Textile World Record.

Asst. Supt. Overseer of Weaving or Dressing. Position wanted by a man 34 years of age, married. Is experienced on worsted suitings and dress goods, cotton worsteds, cassimeres, overcoatings and coverts. Is familiar with Crompton & Knowles and Crompton & Thayer looms. First class references. 3076, Textile World Record.

Asst. Supt. Position wanted by a man 28 years of age, married and American. Has worked Kerseys, broadcloths, venetians, repellants, coverts, wool and cotton, and shoddy mix goods. Is familiar with Johnson & Bassett and Davis & Furber cards, mules, and operators, and Crompton & Knowles looms. First class references. 3568, Textile World Record.

Supt. or Asst. Supt. Position wanted by a man 45 years of age, married and American. Has worked on cassimeres, wool and cotton worsteds, kerseys, cloakings, meltons and cheviots. Is familiar with all kinds of woolen machinery. Good references. 3523. Textile World Record.

Asst. Supt, or Overseer of Dressing. Position wanted by a man 30 years of age, married and American. Has worked on fancy cotton, woolens and worsteds, and all kinds of high and low grade goods. Is familiar with all kinds of woolen and cotton machinery. Good references. 3537, Textile World Record.

Supt. in Small Mill, or Asst. Supt. and Designer. Position wanted by a man 31 years of age. Graduate of English Textile School, and is experienced on fine fancy worsteds, worsted cheviots, piece dyes for men's wear, having been designer on these goods for past 8 years. Good references. 3545 Textile World Record.

Supt., or Asst. Supt. and Designer. Position wanted by a man 29 years of age, American. Is experienced on all kinds of woolens and worsteds, kerseys, broadcloths, thibets, dress goods, cloakings, suitings, etc. Is familiar with all standard makes of woolen machinery. Good references. 3588, Textile World Record.

Supt. or Asst. Supt. Position wanted by a man 38 years of age, married. Has worked on fancy cotton goods, lenos, broad silks, ribbons, hat-bands, cotton-back satins, pongees, etc. Is familiar with all looms, and all machines used in silk mills. Good references. 3560, Textile World Record.

Superintendent or boss weaver in a cotton or woolen mill. Worked on sheetings, shirtings, ginghams, plaids, checks, cottonades and figured jeans. Familiar with all kinds of machinery; 45 years of age; first-class references. 1806, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent, assistant superintendent or assistant designer. Position wanted by a man 28 years of age, married, and American. Is experienced on all classes of woolen goods, and is familiar with Crompton & Knowles looms. Good references. 3591, Textile World Record, Boston, Mass.

Agent, manager or superintendent. Position wanted by a man 42 years of age; married. Is experienced on blankets, dress goods, flannels, steamer and carriage robes. Is familiar with all kinds of woolen machinery. First-class references. 3594, Textile World Record, Boston, Mass.

Superintendent of cotton or woolen yarn mill or shoddy plant. Position wanted by a man 50 years of age, who has had a wide experience in the manufacture of yarns. Understands all makes of cotton and woolen machinery, also held position as superintendent in large knitting mills, and is familiar with the American makes of knitting machines. First-class recommendations. 3249, Textile World Record, Boston, Mass.

Assistant Superintendent and designer, or overseer of weaving. Position wanted by a man 37 years of age; married; American. Has worked on all classes of woolen and worsted goods, ladies' and men's wear, both fancy and piece dyes. Is familiar with Crompton & Knowles looms. Good references. 3605, Textile World Record, Boston, Mass.

Superintendent and Designer. Position wanted by a man 38 years of age; married; worked on men's wear fancy worsteds, cotton worsteds, overcoatings and dress goods. Good references. 3056. Textile World Record, Boston, Mass.

Superintendent or Boss Weaver in a woolen mill. Worked on all kinds of woolen and worsted goods; familiar with all kinds of woolen machinery; 43 years of age; married; English. 3292, Textile World Record. Boston, Mass.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Woolen Mill Manager, formerly of Yorkshire, is open to take a similar position in the United States or Canada. 1976, Textile World Record.

Asst. Agent, superintendent or mechanical engineer in woolen or carpet mill of any kind. Age 30; married. Excellent references. 3178, Textile World Record.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent or Designer. American, 37 years of age, married, wants a position in United States. Worked on light and heavy weight woolen and worsted goods, fancy and plain, wool and worsted piece dyes, also pebble worsteds. Been superintendent 6 years and designer 8. 3353, Textile World Record, Boston.

Agent or Superintendent of woolen or worsted mill. First-class man, American, 35 years of age, is seeking position in the East. Understands business thoroughly. Accustomed to all grades men's wear, woolen and worsted, fancy and piece dyes, also dress goods, shawls, steamer rugs, etc. 3377, Textile World Record, Boston.

Superintendent or superintendent and designer. 45 years of age, with experience on fine fancy worsteds and piece dyes, fancy and piece dye cheviots, fancy woolens and worsteds, also mercerized piece dyes. Understands silk manufacture also. 3382, Textile World Record, Boston.

WOOLEN CARDERS.

Overseer of Carding. Position wanted by a man 34 years of age, married and American. Is experienced on all wool, cotton, cotton and shoddy mixes, knickerbockers, and fancy goods. Is familiar with Davis & Furber, Cleveland, and Lowell Machine Shop carding machinery. Good references. 3565, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 50 years of age, married, and American. Has worked on all kinds of stock, cotton, wool, and shoddy, and waste from 1 run to 8. Is familiar with Davis & Furber, Smith and Cleveland carding machinery. Good references. 3570, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 34 years of age and married. Has worked on outing flannels, suitings, cassimeres, overcoatings, crashes, meltons, skirtings, kerseys, doeskins, broadcloths, coverts, cheviots and thibets. Is familiar with Davis & Furber, Cleveland, English cards and garnett machines. Good references. 3513, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man 47 years of age, married. Worked on woolens and knit goods, both fine and coarse, and all makes of cards. Good reference from mills where he has been employed. 3535, Textile World Record, Boston, Mass.

Overseer of carding and spinning. Position wanted by a man 41 years of age. Has worked on all kinds of woolens, cottons and shoddy mixes. Is familiar with Davis & Furber cards and mules, Cleveland, and any make of cards. Good references. 3598, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Position wanted by a man 56 years of age; married; American. Is experienced on all kinds of stock and is familiar with any make of carding machinery. Good references. 3608, Textile World Record, Boston, Mass.

Overseer of Carding in woolen mill. Worked on all classes of woolen goods, all wool, all cotton, cotton, woolen and shoddy mixes. Familiar with Davis & Furber, Furbush, Goddard and all American makes of machinery. 44 years of age, married and American. 1953, Textile World Record.

Overseer of Carding. Position wanted by a man 39 years of age, married and American. Has worked on all wool stock, wool and cotton mixes, wool and shoddy, cotton and shoddy, and shoddy, and is familiar with all American made cards. First-class recommendations. 1827, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill. Familiar with all kinds of woolen shoddy and cotton mixed goods; also knitting yarn. Familiar with all kinds of American carding machinery and first-class recommendations; 45 years of age; Irish-American. 3313, Textile World Record, Boston, Mass.

Woolen Boss Carder. Worked on all classes of unions, cassimeres, beavers. Familiar with all classes of stock. Will not go West. Age 35; married; first-class references. 3174, Textile World Record.

Overseer of Carding in Knitting Mill. American, 36 years of age; accustomed to knit underwear, both cotton and wool; experience on Davis and Furber and Smith cards. Was 5 years second hand in one mill and for the past 6 years has been overseer. 3391, Textile World Record, Boston.

Overseer of Woolen Carding. American, 44 years of age, with experience in large mills in New York State. Has worked on all classes of woolens and worsteds and hosiery. Best of references. 3389, Textile World Record, Boston.

Overseer of Woolen Carding. American, 30 years of age, married; worked on nearly all classes of woolen goods and all machinery used in this work. Prefers West or Middle West. 3170, Textile World Record, Boston.

Overseer of Woolen or worsted carding. Would accept a position as superintendent of a felt mill. Understand the business in every detail. Worked on all kinds of stock and all makes of cards. First class reference. Will go any place for a good position. 45 years of age, American, married. 3470, Textile World Record, Boston.

Overseer of Carding in woolen mill. Position wanted by a man 46 years of age, married, English. Worked on all kind of woolen goods, cotton and shoddy mixes on English and American carding machinery. Good reference from mills where employed. 3469, Textile World Record, Boston.

WOOLEN SPINNERS.

Overseer of drawing and **spinning.** Position wanted by a man, English, 37 years of age, married. Worked on superfine and fine merinos, demi lustres, mohair, etc. Familiar with Prince, Smith, Hall & Stells, J. B. Farrars and Lowell Machine Shop machinery. Good references. 3478, Textile World Record, Boston.

Overseer Drawing, Spinning or Twisting. American, 35 years of age, with a number of years' experience, wants position. Worked on nearly all grades of yarns from fine to coarse, and on nearly all machinery used in this work. 3345, Textile World Record, Boston.

Overseer of Spinning. Position wanted by a man 26 years of age, American. Has worked on all classes of goods from 3/4 run mohair to 6 and 7 run, including cotton and wool mixes. Is familiar with Johnson & Bassett and Davis & Furber spinning machinery. Good references. 3563, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 30 years of age; English. Has worked all kinds of stock, cotton, wool and shoddy, from 5/8 run to 13 and is familiar with Davis & Furber mules and operators. Good references. 3595, Textile World Record, Boston, Mass.

Overseer of Spinning. Position wanted by a man 37 years of age; married and American. Has worked on all kinds of wool, cotton and shoddy mixes. Is familiar with Davis & Furber and Johnson & Bassett spinning machinery and operators. Good references. 3603, Textile World Record, Boston, Mass.

Woolen Boss Spinner, or would accept a good secondhand position. Familiar with all kinds of American spinning machinery; Davis & Furber, Johnson & Bassett, English mules, Curtis and Platt. First-class references; age 48; English. Could take a position at once. 589, Textile World Record.

Boss Spinner in a woolen mill. 32 years of age; American; familiar with Davis & Furber, Johnson & Bassett and English mules and twisters. First-class references. 3275, Textile World Record.

Boss Spinner or Twister in woolen mill. Familiar with all kinds of woolen, shoddy and mixed goods. Davis & Furber, Johnson & Bassett and English mules. First-class references; 32 years of age; American. 3281, Textile World Record.

Overseer of Spinning. American, with experience on nearly all classes of woolen and worsted goods, and on all machinery used in his work, wants position in the East. Best of references furnished. Wants first-class position. 3384, Textile World Record.

Overseer of Woolen Spinning, or would accept a good second hand position. American; 25 years of age; accustomed to wool and cotton mixes, wool and shoddy, wool pure cotton goods. Worked on the different kinds of machinery used in this work. 3410, Textile World Record.

Overseer of Woolen Spinning. 33 years of age; married, with 6 years' experience as overseer; worked on all kinds of yarns from 3/4 run to 10 run, and on nearly all the machinery used in spinning room. Prefers a position in New England. 3413, Textile World Record.

Overseer of Woolen Spinning. 30 years of age, with experience on all wool, all shoddy, wool and shoddy mixes, etc. Worked on D. & F., J. & B. mules and some other makes. Prefers the East. Would consider second hand position in a large mill. 3431, Textile World Record.

Overseer of Spinning. Position wanted by an American, 36 years of age and married. Worked on wool, cotton and shoddy mixes. Familiar with Davis & Furber mules. Good references. 3484, Textile World Record, Boston.

Overseer of Spinning. Position wanted by a man 35 years of age. Has worked on all wool, wool and cotton and shoddy mixes. Is an experienced overseer and is familiar with English, Platt & Latham, Davis & Furber, Johnson & Bassett, Bridesburgh, Penn and Furbush mules. Good references. 3554, Textile World Record, Boston, Mass.

Overseer of Woolen Spinning. Position wanted by a man 48 years of age, married, English. Worked on all kind of yarns, wool, cotton and shoddy mix, on D. & F., J. & B., Platt, Curtis & Kent mules. Good references from first-class mills. Would prefer a position in middle west. 3499, Textile World Record, Boston, Mass.

WOOLEN WEAVERS.

Overseer of Woolen Weaving. Position wanted by a man 36 years of age; married. Has worked on satinets, unions, cassimeres, men's wear, dress goods, overcoatings and blankets. Is familiar with Knowles, Gilbert, Stafford and Crompton looms. First-class references. 1790, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 39 years of age, American. Has worked on unions, cassimeres, shirtings and overcoatings. Is familiar with Crompton & Knowles looms. Good references. 3601, Textile World Record, Boston, Mass.

Overseer of Weaving. Worked on ginghams, sheetings, shirtings and dress goods. Familiar with Crompton & Knowles and Mason looms. First-class recommendations, 23 years of age. 3299, Textile World Record, Boston, Mass.

Overseer of Weaving, or would consider a good loom fixing job in a woolen mill. Age 47; Protestant; good references. 3247, Textile World Record.

Overseer of Weaving. 40 years of age, with 20 years' experience fixing and weaving in New England. Understands plain and fancy woolens and worsteds. Crompton and Knowles looms. Good references. 3369, Textile World Record.

Overseer of Weaving. 36 years of age, with 18 years' experience in a large mill in Massachusetts. Accustomed to woolens and worsteds, high and low grade, and to all machinery used in weave room. Prefers position in or about New England. 3373, Textile World Record.

Overseer of Weaving, or weaver and designer. American, 40 years of age, with experience on all grades men's wear and all makes of woolen looms, pickers, spoolers, twisters, etc., wants a position in the East. 3379, Textile World Record.

Boss Weaver in a Woolen Mill, or a fixing job with chance of advancement. Worked on worsted dress goods, cassimeres and cotton warp goods, beavers, etc. First-class recommendations; 32 years of age; American. 3329, Textile World Record.

Boss Weaver in a Woolen Mill or superintendent of small mill. Worked on ladies' dress goods, men's wear, flannels, blankets, Indian robes, both jacquard and chain loom work. 38 years of age; married; first-class references. 3324, Textile World Record.

Boss Weaver in Woolen Mill, or would accept a good loom fixing position. Worked on satinets, cotton and woolen warp goods, sheetings, shirtings and ducks. Also worked on cotton and woolen jute bagging. 45 years of age. 1806, Textile World Record.

Overseer of Woolen Weaving or boss dressing. Worked on all kinds of woolen and worsted dress goods. A good manager of help. Could handle both dressing and weaving in medium sized mill. First-class references; 42 years of age. 3293, Textile World Record.

Overseer of Woolen Weaving. American, 40 years of age, married, with experience on worsteds, cassimeres, kerseys, dress goods, satinets, etc., wants a position in the East. Has worked on all machinery used in this work. 3412, Textile World Record.

Young Man, American, wants position as boss weaver or assistant superintendent. Has worked on fancy worsteds, cassimeres and cheviots. Can also design. 1712, Textile World Record.

Overseer of Woolen Weaving. American, 37 years of age, accustomed to fancy worsteds and woolens, dress goods, etc. Held last position 6 years. Prefers the East. 3397, Textile World Record, Boston.

Overseer of Woolen Weaving, 46 years of age, with experience on fine and coarse cassimeres, meltons, worsteds, beavers, blankets, flannels, etc. Would prefer position in Middle States. 3386, Textile World Record, Boston.

Overseer of Woolen Weaving, 44 years of age, with experience on woolen and worsted cassimeres, dress goods, overcoatings, etc., and on Knowles and Crompton looms. Would like position in the Middle West. 3385, Textile World Record, Boston.

Overseer of Woolen Weaving. American, 36 years of age, has had experience as overseer and on about all classes of woolen goods; Knowles and Crompton looms. Will go anywhere for good position. 3395, Textile World Record, Boston.

FINISHERS.

Overseer of Finishing. Position wanted by a man 46 years of age; married; American. Has worked on woolens and worsteds of all kinds, and is familiar with all makes of finishing machinery. Good references. 3610, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man 27 years of age; married; American. Has worked on cassimeres, dress goods, all face finished goods, fancy and cotton worsteds, piece dyes, satinets, etc. Is familiar with all kinds of finishing machinery. 3338, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man 37 years of age, married. Has worked on cassimeres, dress goods, cheviots, cotton mixes, broadcloths, etc. Is familiar with all kinds of finishing machinery. Good references. 896, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by man in the prime of life, energetic and a hustler, with 20 years of experience as overseer on all classes of goods from loom to case, in first-class mills. Age 46; married; steady, temperate and reliable. 3333, Textile World Record.

Overseer of Wet Finishing. Worked on all kinds of woolen goods, both high and low stock. Would accept a position at short notice. 47 years of age; married; first-class references. 3322, Textile World Record.

Overseer of Finishing. Worked on cotton unions, dress goods, cassimeres, beavers, kerseys, covert and army goods. First-class recommendations; 55 years of age. 1661, Textile World Record, Boston, Mass.

Foreman of cotton finishing room. Eight years' practical experience on napping machines, starching and calendering. Worked in mills in Italy and America. Married. 3155, Textile World Record.

Overseer of Finishing. Worked on fancy worsteds, piece dyes and mercerized goods of all kinds. Worked on all kinds of finishing machinery. Age 25; English; unmarried. 3213, Textile World Record, Boston.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 3163, Textile World Record, Boston.

Boss Finisher of underwear, cotton or wool mixed goods, who understands Wheeler & Wilson buttonhole machines, Union Button, Union Special, etc., is open to a position in the New England or Middle States. 30 years; American; married. Been employed for a number of years by concern for whom he is now working. Exceptionally good references. 1958, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Boss Finisher, or would take a second hand position or wet finishing. Familiar with all kinds woolen and worsted goods, both steam and dry finishing. Age 45; English; first-class references. 2061, Textile World Record.

Overseer of Finishing. Position wanted by a man 30 years of age, married, American. Worked on worsteds and woolens, both high and low grades, and all kinds of finishing machinery. First-class recommendations. 3503, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man 43 years of age, American and married. Has worked on all classes of fancy worsteds and is familiar with all kinds of finishing machinery. Good references. 3497, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man 43 years of age, married. First-class references from good mills. Worked on kerseys, beavers, cloakings, cassimeres, dress goods, blankets, satinets on American and English machinery. Will not go to Canada, West or South. 3502, Textile World Record, Boston, Mass.

Overseer of Woolen Finishing. 44 years of age; married; Scotch. Worked on ladies' dress goods and face finished goods from loom to case. 3446, Textile World Record.

DYERS.

Overseer of Dyeing. Position wanted by a man 30 years of age, American. Has worked on worsted and cotton yarns, mercerized piece dyes, fast shades on raw stock and slubbing. Is familiar with all kinds of dyeing machinery. Good references. 3592, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 45 years of age; married; American. Has worked on cotton yarn and raw cotton. First-class references. 3609, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 26 years of age; married; American. Has worked on dress goods, cassimeres, piece dyes, worsteds, cotton worsteds, raw stock and skein dyeing. Is familiar with all kinds of dyeing machinery. Good references. 3612, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 30 years of age; married; American. Has worked on hosiery, cotton, wool, silk and mixtures. Is experienced on printing and bleaching raw stock and yarns. Fast black on hosiery a specialty. Good references. 2052, Textile World Record, Boston, Mass.

Boss Dyer long and short chain skein yarns, indigo blues, raw stock and bleaching. 48 years of age; married; Scotch; good reference. 3442, Textile World Record, Boston.

Overseer of Woolen Dyeing. American; 31 years of age. Worked on raw stock, piece dyes, indigo vats, etc. 10 years' experience as overseer. Wants position in New England or New York State. 3435, Textile World Record, Boston.

Boss Dyer. Worked on woolens and worsteds, serges, meltons, all kinds of woolen cloth and worsted yarn. First-class recommendations; 35 years of age; Scotch. 3064, Textile World Record, Boston, Mass.

Boss Dyer. Twenty-six years' experience in all in woolen mills, 22 years being an overseer; middle-aged; American; married; will not go South or to Canada. 3134, Textile World Record.

Expert Hosiery Dyer. Age 27; married and sober. Desires position of superintendent of dyeing in a first-class hosiery mill, one manufacturing high grade goods preferred. Has had over seven years' practical experience in dyeing one of the best aniline blacks on cotton, also fast colors on cotton, wool, silk and union hosiery. Best of references furnished. 2052, Textile World Record.

Overseer Dyeing. American, 28 years of age, with experience, wants position in the East. Has had experience with fast colors to work with woolen yarns, mercerized dyeing and bleaching, also web, elastic and non-elastic. 3347, Textile World Record, Boston.

DESIGNERS.

Assistant Designer on cotton or assistant in the weave room. Worked plain twills, sateens and dobby cloth. Age 21; English; single. 3230, Textile World Record.

Designer. Understands all kinds of worsted and woolen goods for men's or women's wear. Could take a position at once. Age 28 years; first-class references. 3264, Textile World Record.

Designer on cotton, or assistant on woolen, worsted or Jacquard work. Age 31; American; unmarried. 3190, Textile World Record.

Designer on any class of dress goods waistings, mantle cloths, fine shirtings, etc. 3203, Textile World Record.

Designer. Worked on ladies' dress goods, shirtings and flannels and some jacquard designing; first-class recommendations; 33 years of age; married. 3285, Textile World Record.

Designer. Familiar with suspender, elastic and non-elastic; also tapes and dress goods. 29 years of age; first-class references. 3186, Textile World Record.

Designer or superintendent. Age 37; English; married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Wants $30 to $40 per week. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

KNITTERS.

Manager or Superintendent in underwear mill. Position wanted by a man 50 years of age, married and American. Has worked on fancy balbriggans and flat goods. Is familiar with Davis & Furber, and Campbell & Clute knitting machines. Was once in business for himself. Good references. 3519, Textile World Record, Boston, Mass.

Overseer of Knitting and finishing, or assistant superintendent. Position wanted by a man 40 years of age and married. Is experienced on all kinds of knit goods, more especially on ribbed underwear, silk hosiery, knit gloves and mittens. Is familiar with Nye & Tredick, McMichael & Wildman, Brinton, Scott & Williams knitting machines and all kinds of sewing machines, lace bar machines, and German Terrot loopers. First-class references. 3556, Textile World Record, Boston, Mass.

Overseer of Knitting, spring needle preferred. Position wanted by a man 25 years of age. Single, American. Worked on spring needle work men's, boys', ladies' balbriggan gauges, ranging from 24 to 36. Fleece goods gauges from 18 to 30. Flat goods, 16 to 20. Latch needle goods, men's, boys', ladies', misses' cotton goods from 8 to 10. Good references. 3553, Textile World Record, Boston, Mass.

Overseer of Knitting or machine fixer. Position wanted by a man 34 years of age, married, and an American. Has worked on all grades and styles of men's, women's and children's underwear. Is familiar with McMichael & Wildman, Nye & Tredick, Stafford & Holt, Leighton, Champion, Scott & Williams, Lamb and Grosser knitting machines, and nearly every kind of sewing machines. Has first-class references. 3505 Textile World Record, Boston, Mass.

Overseer of Knitting or Fixer on Cooper Machines. Position wanted by a man 25 years of age; married; accustomed to silk, wool, cotton or lisle. Would prefer a position in Mass. American; first-class reference. 3417, Textile World Record, Boston, Mass.

Overseer of Knitting or knitting machine fixer. Position wanted by a man 22 years of age, English. Has worked on ladies' and gentlemen's fine knit underwear. Is familiar with Cooper Rib Circular and Cooper Circular Cuff machines. Good references. 3597, Textile World Record, Boston, Mass.

Superintendent or foreman of knitting. Position wanted by a man 25 years of age, American. Is experienced on men's, women's and children's gloves and mitts, fine-stitch toques and hosiery on worsted and saxony Creelman machines. Is familiar with the Lamb machine, more especially on gloves and mitts, the Brinton full automatic machine and the Creelman hosiery machine. Will be open for engagement about Sept. 1st. First-class references. 3611, Textile World Record, Boston, Mass.

Superintendent or overseer of knitting. Position wanted by a man 41 years of age; married; American. Has worked on all classes of underwear and hosiery on spring and latch needle. Is familiar with all makes of knitting machinery. Good references. 1874, Textile World Record, Boston, Mass.

Superintendent or Overseer in Hosiery Mill. All classes seamless hosiery. Understands Branson and Automatic ribbed toe machines; also Pepper and 3/4 Automatic Excelsior. Age 49; good references. 1441, Textile World Record.

Foreman of Knitting Room. Age 29; American, unmarried. Fleece of all kinds and gauges. Balbriggan from 20 to 30 gauge. Flat work wool goods. Tompkin Bros. and Campbell & Clute machines. Will not go South. 3204, Textile World Record.

Manager of a Hosiery Mill. Familiar with woolen, worsted and cotton and full-fashioned seamless hosiery. 45 years old, American. First-class references. 1657, Textile World Record, Boston, Mass.

Boss Knitter. Worked on sweaters, toques, both woolen and worsted, cylinder and flat machines. Could take position in one week's notice. First-class recommendations; 33 years of age; married. 3278, Textile World Record, Boston, Mass.

Overseer Boarding and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk; age 41:: American; married. Can furnish references. 3035, Textile World Record.

COTTON CARDERS.

Secondhand in carding or spinning room of cotton mill, or a position setting up carding or spinning machinery. Understands the Dobson & Barlow, Howard & Bullard, Platt Bros. and Curtis machinery. Is 26 years of age; Swedish; worked on coarse yarns from 2s to 50s, on fine yarns from 70s to 100s. Good references from mills in England and Sweden. 3602, Textile World Record, Boston, Mass.

Overseer of Carding. Position wanted by a man 43 years of age, married and American. Has worked on print cloth, cambrics, sheetings, etc., all white cotton. Is familiar with American and English carding machinery. First-class references. 3599, Textile World Record, Boston, Mass.

Overseer of Cotton Carding. Worked on all kinds of yarn. At present employed in a large mill, but will change for a better position. Familiar with all kinds of machinery. Will not go South. 36 years of age; French. 1991, Textile World Record.

Second Hand in card room. **American; 30 years of age, with a number of years' experience in cotton card room work. Has worked in large mills in Fall River and New Bedford, and on prints, fine and coarse yarns, and English and American machinery. Prefers a position in the East. 3341, Textile World Record.**

Overseer of Carding and Frame Spinning. Worked on all kinds of stock, both high and low. 30 years of age; first-class recommendations. 1759, Textile World Record.

Overseer of Cotton Carding or assistant superintendent. Worked on all kinds of cotton, including cotton waste, Sea Island and down to sweepings. Familiar with all kinds of carding machinery; first-class recommendations; 29 years of age; married. 3323, Textile World Record.

Overseer of Carding. American; **26 years of age;** worked in all positions in card room up to overseer. Understands nearly all makes of English and American machinery and has worked on white goods, both fine and coarse. **3346, Textile World** Record.

Overseer of Spinning. Spooling, Warping. Position is wanted by a man 35 years of age, married, American. Has made yarns from 8s to 80s on all makes of spinning machinery. Worked on all makes of spooling, warping, twisting machines. 3468, Textile World Record, Boston.

Overseer of Mule and Ring Spinning. Position wanted by a man, English, 35 years of age and married. Worked on hosiery, coarse and medium and fine yarns, more accustomed to medium yarns. Is graduate of a textile school and familiar with Parr & Platt mules, Mason mules and Whitin and Lowell frames. 3483, Textile World Record, Boston.

COTTON SPINNERS.

Overseer of ring spinning, spooling and warping. Position wanted by a man 32 years of age, American. Has worked on denims, plaids, awnings, checks, lawns, sheetings, lenos, shirtings, etc. Is familiar with Mason, Whitin, Lowell, Davis & Furber and Fales & Jenks, spinning machinery. Good references. 3604, Textile World Record, Boston, Mass.

Overseer of mule and ring spinning. Position wanted by a man 40 years of age; married; English. Has worked on all kinds and numbers of cotton yarn. Is familiar with all makes of mules. Good references. 3607, Textile World Record, Boston, Mass.

Overseer of Ring Spinning, spooling, long chain beaming, slashing and drawing-in. All kinds of fancies, sheetings, etc. $3.00 per day up. 3202, Textile World Record.

Overseer of Ring Spinning, spooling and warping. Worked on all classes of goods, hosiery yarns, long and short staples from 8s up. Familiar with Sayles & Jenks, Mason, Lowell, Whiting and Saco & Pettee machinery. First-class references. 28 years of age; married. 3308, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

Overseer of web drawing, slashing, spooling and warping on white cotton goods. 36 years of age; Irish; married. 3201, Textile World Record.

MISCELLANEOUS.

Position Wanted. Overseer boarding and finishing hosiery. Thoroughly practical on all classes and grades of hosiery; years of experience; American; can furnish reference. Address Finisher, Textile World Record, Boston, Mass.

Position Wanted as master mechanic of a cotton mill by mechanic of 16 years' experience. Familiar with the different power transmissions, steam engines, condensers, pumps, boilers, electric lighting, etc.; A1 references. Address Master Mechanic, Textile World Record, Boston, Mass.

Cotton Goods for Blouses, Dresses, Shirts, etc. Gentleman of education and highest respectability, former commercial manager of important textile company; artistic, technical, commercial knowledge; one of the best experts in Austria in colored weaving (also expert in spinning, dyeing, finishing), wants situation. Long years' experience in sampling and manufacturing fancy goods from cheapest to most expensive kinds. Speaks many languages. Highest references. Address A. O. Frank, Hauptpost lagernd, Vienna, Austria.

Overseer of Mercerizing, Bleaching and Dyeing wishes a position of responsibility. 25 years' experience in this line. Understanding the construction of machines; has invented and built machines for mercerizing cotton skein and warps. Would like to enter into partnership with good reliable party. Will be at liberty after July 1, 1906. Address "Mercerizer," Textile World Record, Boston, Mass.

Overseer of Worsted Drawing. Position wanted by a man 30 years of age, married, and American. Is experienced on mohair, alpaca and wool. Bradford system, and is familiar with Prince, Smith and Hall & Stells, worsted machinery. Good references. 3593, Textile World Record, Boston, Mass.

Manager or superintendent of a worsted mill. Position wanted by a man 33 years of age, married and English. Is experienced on all grades of wool and hair, and is familiar with all makes of worsted machinery. First-class references. 3596, Textile World Record, Boston, Mass.

Overseer of silk and cotton weaving. Position wanted by a man 46 years of age; married; German. Has worked on fancy lenos, taffetas, satins, hard silk and skein dyed. Is familiar with all makes of looms. Good references. 3613, Textile World Record, Boston, Mass.

Overseer of slashing, drawing in, spooling, warping and beaming. Position wanted by a man 46 years of age; married and American. Is experienced on colored and white work, and familiar with Saco & Pettee, Lowell, and Draper machinery. Good references. 3600, Textile World Record, Boston, Mass.

Overseer of weaving, drawing in and twisting. Position wanted by a man 44 years of age; married; English. Has worked on plain twills, sateens, fancy lenos, Jacquard loppetts, also plush goods. Is familiar with Mason, Draper, Whitin and Crompton & Knowles looms. Good references. 3590, Textile World Record, Boston, Mass.

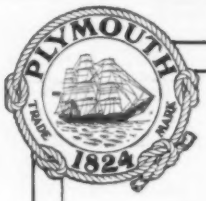
Superintendent or assistant superintendent of a cotton mill. Position wanted by a man 29 years of age; married. Is experienced on sheetings, shirtings, ginghams, flannelettes, domets and fancy hosiery yarns. Is expert on colored work. Is familiar with all kinds of American and English carding and spinning machinery. First-class references. 1718, Textile World Record, Boston, Mass.

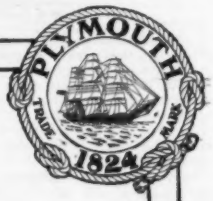
Boss Dyer, Mercerizer and Bleacher. Worked on wool yarns, cotton piece goods, and familiar with slubbing. 43 years of age, married, good references. 3097, Textile World Record.

Second Hand in Cloth Room wants position as overseer or second hand; 20 years' experience on all kinds of goods; understands napping thoroughly; good references. 3048, Textile World Record.

Overseer of Dyeing. American, 40 years of age, with experience on woolen, cotton and silk piece goods, unions, woolen and cotton yarns, also aniline black and sulphur colors; worked on all kinds of machinery used in this work; prefers a position in the East. 3021, Textile World Record, Boston.

Boss Dyer and Bleacher. Scotch. Good experience and references. Underwear. 3195, Textile World Record.





"PLYMOUTH" Transmission Rope

ONLY the highest grades of Manila hemp enter into this the highest grade Transmission Rope.

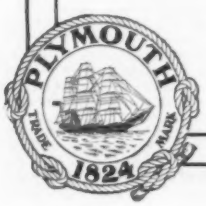
This condition, supplemented by top-notch workmanship and the "know how" developed by years of study and experience, results in the production of a rope for power transmission that is near perfection and that careful tests will show gives the maximum of service for a given expenditure.

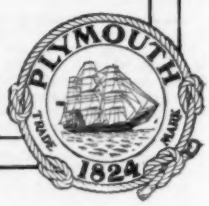
Our booklet on "Rope Driving" contains a fund of useful information on the subject.

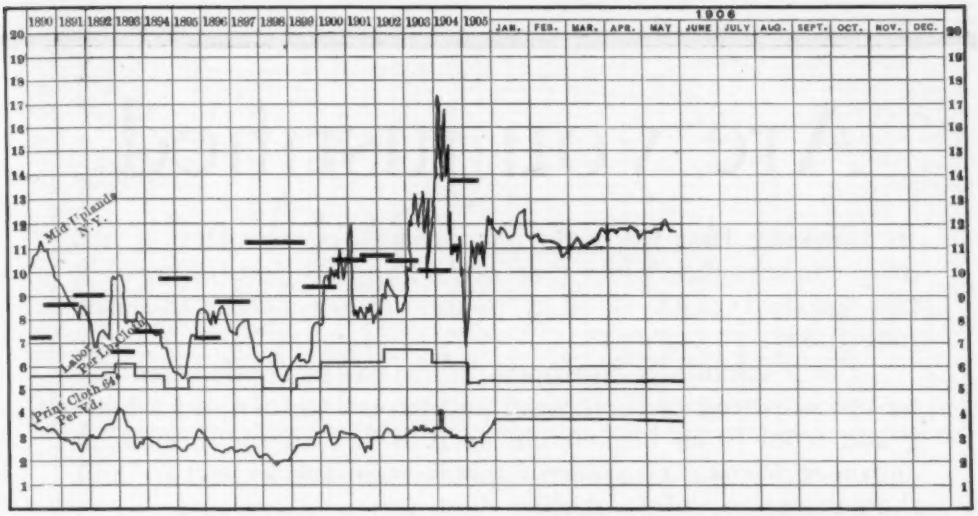
Plymouth Cordage Co.,

ESTABLISHED 1824.

North Plymouth, Mass.







The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

In the absence of speculative manipulation prices have remained steady. A significant feature is the resistance shown to every attempt to bear the market. The weather has been favorable throughout the cotton belt and the prospects for the growing crops are excellent. The bearish influence that this condition exerts is more than counterbalanced by the state of the goods market. Buyers are taking goods at prices that correspond to 12 cents for the raw material. There is some disposition to restrict purchases to actual requirements and avoid contracts for goods, but when it comes to doing business it is a seller's market, principally because of the shortage of help to run the mills. The unprecedented activity in foreign cotton mills is causing the largest consumption of cotton on record. The extent of this increase is indicated by the fact that the new mills built in Lancashire during the past two years have a capacity equal to two-thirds of all the cotton mills in our Southern States. The increase in consumption is so large as to dwarf such influences as favorable weather and to make any material decline in cotton extremely improbable. The world's stock of American cotton, as estimated by the Chronicle, reflects the increasing withdrawals for consumption by spinners. The estimate for May 25 is 2,334,532 bales, as compared with 2,615,760 bales on same date in 1905, 1,520,295 bales in 1904, and 1,623,367 bales in 1903. The significant fact about these figures is that the present stock is but 814,237 bales more than in 1904, although in the meantime the supply has included one crop of 14,000,000 bales, which is 3,000,000 above what may be fairly considered a normal crop under present conditions. The total stock, including East Indian and Brazil, as estimated by the Chronicle on May 25, amounted to 3,833,532 bales, against 3,950,760 bales in 1905, 2,615,295 bales in 1904, and 2,791,367 bales in 1903.

The movement into sight from Sept. 1 to May 27 is estimated by the same authority for a series of years as follows:

1900-01	9,695,965 bales
1901-02	9,837,454 bales
1902-03	10,221,498 bales
1903-04	9,600,426 bales
1904-05	11,970,712 bales
1905-06	10,094,693 bales

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA

Are you justified

in thinking that the scouring process is a matter of but little consequence when it so often happens that the wool in the finished cloth is of a poorer quality than the raw material?

For a splendidly equipped mill to pay but little attention to the scouring of their wool and expect to turn out a high grade wool is as impossible as it is for an inexperienced engineer to run a modern express train and expect to land the passengers safely at their destination.

Wyandotte Textile Soda

is not a cure-all, but is an especially prepared chemical for wool scouring purposes. It possesses detergent and cleaning properties of high order.

Wyandotte Textile Soda does not injure the natural properties of the wool, nor cause a yellowish tinge. It leaves the wool soft, lofty and of a snowy whiteness.

None Genuine except with a card bearing this Trade Mark

In Every Package.

We would be pleased to have you order this material from your supply house. Once you know its value you will be as anxious to use Wyandotte Textile Soda as we are to have you.

The J. B. Ford Co.,

SOLE MANUFACTURERS,

Wyandotte, Mich.

THIS SODA WAS AWARDED THE HIGHEST PRIZE — GOLD MEDAL — AT BOTH THE ST. LOUIS AND PORTLAND EXPOSITIONS.

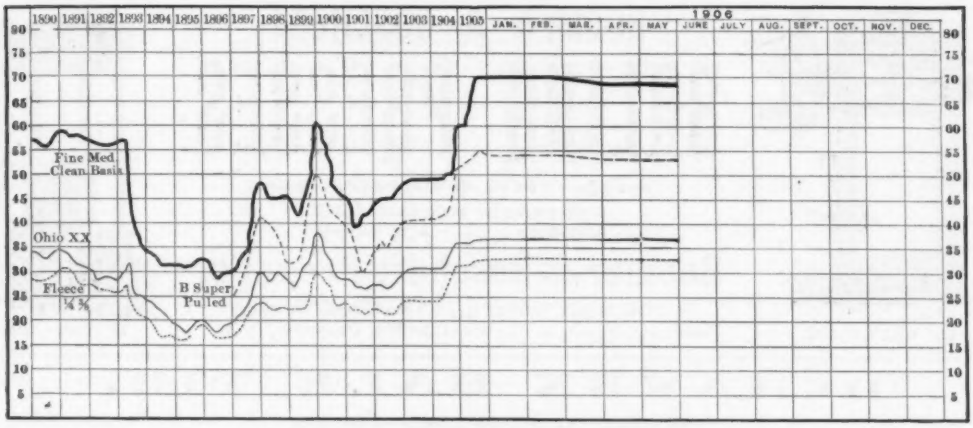
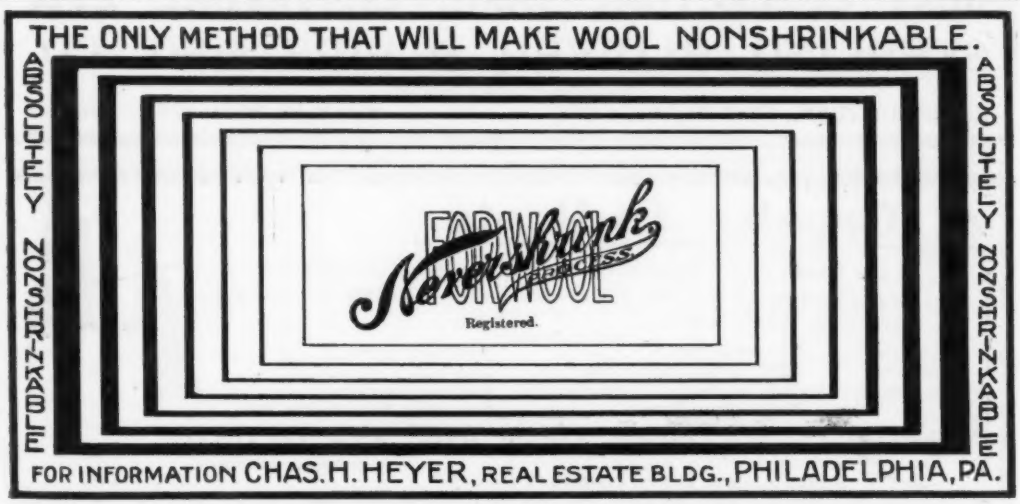


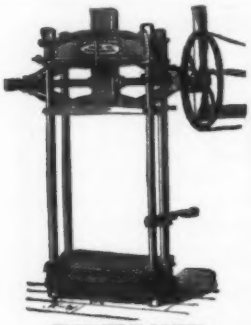
CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

Wool Market.

Sales have been small during the past month. Stocks are small in Eastern markets and owners have been content to await developments. The extreme views of Western growers have influenced every one with one on hand. The demand for wool has not been in evidence, and, consequently, an essential factor in a boom market is lacking. Manufacturers are not ready to speculate on wool at the high prices prevailing. A few of the larger dress goods mills that have booked orders for goods for the coming season have bought some large lots of wool, but manufacturers as a general thing are holding off waiting for the general opening of light weights. They profess to believe, and apparently with good reason, that a material advance in wool above present prices is impossible, that if any change takes place it will be downward. This conclusion is based on the assumption that the final consumer cannot afford to pay any higher prices for woolen goods, and that if he cannot get them for the same price or for less he will use wool substitutes, cotton if the worsted finish continues in fashion, shoddy if the rough cheviot or cassimere face returns to favor.

The foreign markets for wool are strong. There was a brisk demand at the last London sales, the advance at the start being maintained to the end. Large sales were made for American account. Several large lots bought in Australia and resold at London showed large profits over the colonial prices.


THE ONLY METHOD THAT WILL MAKE WOOL NONSHRINKABLE.
ABSOLUTELY NONSHRINKABLE
FOR WOOL
Registered.
FOR INFORMATION CHAS. H. HEYER, REAL ESTATE BLDG., PHILADELPHIA, PA.



KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

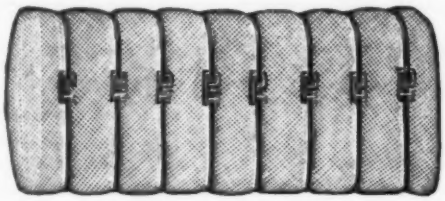
Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

HYDRAULIC.

DEHAVEN BALE TIE.

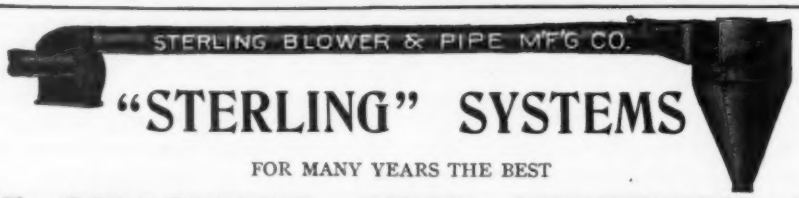
Use De Haven Bale Tie and save claims for damaged goods.



The only method of baling cotton that insures the goods arriving at destination in good condition.

The days of rope for baling cotton are over. All up-to-date mills are now using De Haven's galvanized bale tie with Patented buckle. It makes a neater and cheaper package and saves the shipper those annoying claims for damaged goods so common with the old method of baling. Write us for samples and prices.

DE HAVEN MANUFACTURING CO., BROOKLYN, N. Y.



"STERLING" SYSTEMS

FOR MANY YEARS THE BEST

DUST COLLECTING, WOOL CONVEYING, ETC.

STERLING BLOWER & PIPE MFG. CO.

Write for "1906" Catalog.

HARTFORD, CONN., 1027 Huyshope Ave. New York Office, 136 Liberty St.

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In the Hands of a Competent Man Will Increase the Efficiency of Your Plant and Cut Down Your Coal Bill. Faultless in Design. Perfect in Workmanship.

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TRADE MARK CROSBY

Pop Safety Valves
Pressure and Vacuum Gages
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Rubber Pump Valves

Recording Gages
Single Bell Chime Whistles
Feed Water Regulators
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Gage Glass, Water Gages, Etc.

CROSBY STEAM GAGE AND VALVE CO.

Stores:
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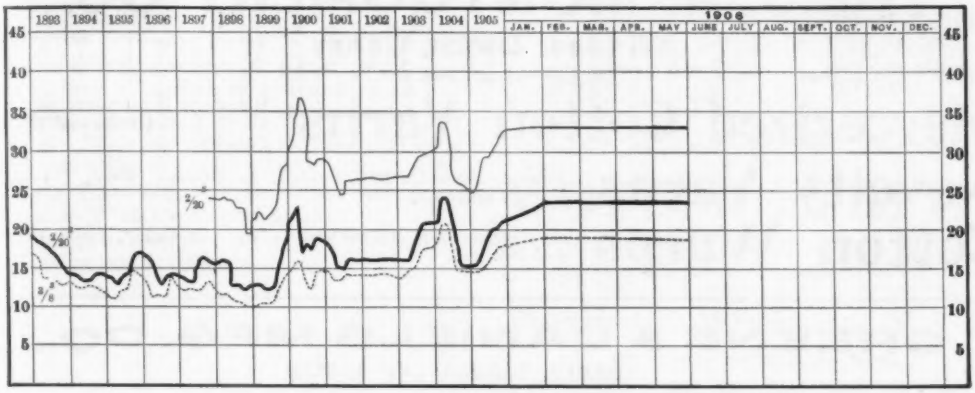


GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn Market.

Mills are sold so far ahead that many spinners are refusing to take new contracts because of remoteness of date of delivery and possibility of an advance in prices in the meantime. Stocks of yarn are small and the demand from both weavers and knitters is brisk. The business under these conditions consists mainly of deliveries on old contracts. On new business prices are firm. Buyers are talking lower prices, but it ends in talk, and when business is done it is at full rates. The high price of the raw material, the scarcity of mill help, the sold-up condition of the mills and the record demand for goods at home and abroad make a combination of circumstances under which the spinner is in a position to insist on his terms.

We quote as follows:

Eastern Cops.

6s	18¾
8s	19¼
10s	19¾
14s	20¾
16s	21¼
18s	21¾
20s	22¼
22s	22¾
24s	23¼
26s	23¾
30s	24¾
34s	25½
36s	26½
40s	28

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12s	21
14s	22
18s	23
20s	24
24s	25
26s	26
30s	28-29
36s	33
40s	36
45s	39
50s	43
55s	45
60s	47

Eastern Two-Ply Warps, Carded Peeler.

2/30s	28-29
2/36s	33
2/40s	36
2/45s	39
2/50s	43
2/60s	47-48

Egyptian Weaving Yarns. Single Skeins Combed.

30s	38
36s	40
40s	42
45s	45
50s	49
55s	52
60s	55
70s	60

Philadelphia Market.

The conditions in the yarn trade are not materially changed from last month, the demand still being exceptionally good, both in weaving and knitting yarns. Spinners have generally had a favorable season, and we believe knitters and weavers also have had a fair volume of business.

The demand, together with the firm position of cotton, has kept prices firm. Some manufacturers are commencing to talk cheaper cotton for the

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps.

DYE SULPHUR BLACKS DIRECT IN COPS, CONES OR TUBES.

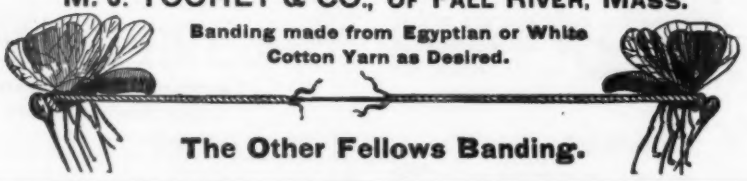
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

new crop, and it is a fact that probably the new crop can be bought today a little cheaper than spot cotton, but the fact is realized by all who understand the cotton business, that the new crop is not assured in any way, for a long time to come. The increase in acreage is too small to have any effect against an unfavorable season, and a large crop can never be raised—except with all conditions favorable. We believe that no one is expecting any violent decline in the cotton market, even with a fairly large crop next season.

We quote as follows:

Southern frame spun cones:—

7s and coarser	19
8s and 9s	19¼
10s	19½
12s	20
14s	20½
16s	21
18s	21½
20s	22
22s	22½
24s	23
26s	24
30s	26
40s	33
50s	38

Southern high grade mule yarn:—

Cones.

10s	20½
12s	21
14s	21½
16s	22
18s	22½
20s and 22s	23-23½
24s	24

Southern frame yarn, lower grades:—

6s and 8s	18½
10s	19

Eastern cones (high grade quality):—

10s	21
12s	21½
14s	22
16s	22¾
18s	23¼
20s and 22s	23¾-24¼

Skein yarn (mostly Southern):—

4s and 8s soft	18½
10s to 12s	19½
14s to 20s	20-20½
22s	21½
14/2	20
16/2	21½
20/2	23
30/2	27½
40/2	35
16/3 slack	21
12/3 slack	20
8/3 carpet	19
8/3 slack	19
9/4 slack	19

Warps (Southern):—

10s to 12s	19-19½
14s	20

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
AND COTTON CLOTHS.
122-124 Chestnut Street, PHILADELPHIA, PA.
73 Leonard Street, NEW YORK.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

H. D. Salkeld & Bro.
COMMISSION MERCHANTS
With FRED'K VIETOR & ACHELIS
COTTON YARNS
66-72 LEONARD STREET - - NEW YORK

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

LUDWIG LITTAUER,
Successor to MOELLER & LITTAUER.
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.
HIGH GRADE HOSIERY YARN
White and Colors. All Numbers.
Sewing Twines on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
CANNON MILLS, 55 Leonard St New York.

SPINNING MILLS:
NEW BEDFORD, FALL RIVER, TAUNTON.

DYE AND BLEACH WORKS:
FALL RIVER, TAUNTON.

NEW ENGLAND COTTON YARN CO.

KNITTING AND
WEAVING YARNS

EVERY DESCRIPTION AND FORM
Gray, Bleached, Dyed and Mercerized
600,000 MULE AND FRAME SPINDLES

C. MINOT WELD, President.
HENRY C. SIBLEY, Treasurer.

ARTHUR R. SHARP, General Manager.

Executive Office:
141 Milk Street, Boston.

BRANCH OFFICES:
ALBANY, Broadway, cor. State St.
CHICAGO, cor. Clark and Adams St.
NEW YORK, 73 Worth St.
PHILADELPHIA, 213 Chestnut St.

C. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS

Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

JENCKES SPINNING CO.

Formerly E. JENCKES MFG. CO.

Carded and Combed Cotton Yarns for Weavers and Knitters
Double and Twist Yarns for Woolen Trade.

PAWTUCKET, R. I.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

Indian Orchard Company
Cotton Warps and Yarns.
In Gray and all Colors, Single or two or more Ply, and Cable Cord
Novelty Yarns.
in Various Patterns, Colors and Twists.
Carded and Colored Cotton.
For Mixing with Wool, Machined or in Roving.
Indian Orchard, Mass.

16s	21
20s to 22s	21-22
26s	23
14/2	21
16/2	21½-22
20/2	23
24/2	24
30/2	27½
40/2	35

Mixed colored yarns (mock twist, half colors):—

6s to 10s	19-19½
12s to 14s	20½-21½
16s to 18s	22-23

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Some spinners are busy and refuse to take on further orders; others have many orders booked and are striving to get spinning instructions, but all of them are firmly maintaining prices and are looking forward to a good demand for yarn when the light weight season opens in July.

The one bright spot from the spinners' standpoint has been the great demand they have had from dress goods manufacturers. The dress goods weavers were swamped with orders for Panama cloth and the spinners "next to this business" have secured and delivered many thousand pounds of 2/36 at $1.00 per pound. This trade still continues. The other outlet from the dress goods weavers,—the cream serge, has not been so successful. The orders for this class of business were suddenly cancelled and weavers have many pieces on their hands which cannot be sold at present. The bunting weavers are doing a slow business and are up against it on the price of yarn. The buyers state they will buy only from time to time on the present market. Most of their sales are for bunting made from cotton warp and worsted filling. This is all the business that can be secured, but is not satisfactory to the weavers because of the high cost of cotton dyes to make fast colors.

Some of the men's wear weavers have sold up and are unable to take more orders on the present season's styles,—but these orders are largely for the cheaper grades of cotton worsted or cloth made from part cotton and part worsted. The better grades have not sold well and the suspicion is still growing that the buyers are giving up the cheaper grades of cloth to the domestic weavers and are getting their better grades of cloth from Europe.

Many yarn orders given early in the season, especially for worsted overcoat linings, have not been taken because the weavers, although having the orders, cannot get specifications from the

WONALANCET COMPANY
NASHUA JUNCTION, N. H.
Manufacturers of a superior grade of
CARDED COTTON
Gulf and Peruvian—in the white
To Meet the Most Exacting Needs of
WOOLEN MILLS

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps,
Cones, Cops,
Tubes
COTTON YARNS
426 and 428
Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job
Gassing, Winding, etc. All Numbers.
GASSED YARN SPECIALTIES

CELEBRATED BRAND PYRAMID LACINGS
For Underwear, Overshirts and Sweaters,
JOHN CATHCART & CO.,
115 Franklin Street, NEW YORK.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind
on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

You Save Enough Insurance to Pay for the Equipment.
So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.
Pettes & Randall Co., 150 Nassau St., New York

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
65-67 WORTH STREET, NEW YORK

Pocasset Worsted Company,

WORSTED YARNS

IN THE GRAY.

Mills at
Thornton, R. I.

Office
100 Boylston St., Boston, Mass.

French System. **B. F. BOYER CO.,** Bradford System.

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

EDDY & STREET,
Cotton, Woolen
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills,
Loridan Worsted Co.

300 Chestnut Street,
PHILADELPHIA, PA.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.
Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

YARNS Solis, Boston.
77
SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH CO.,

Diamond Stay Bindings
TRADE MARK

Manufacturers of
Tapes, Webbing and Bindings.

COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

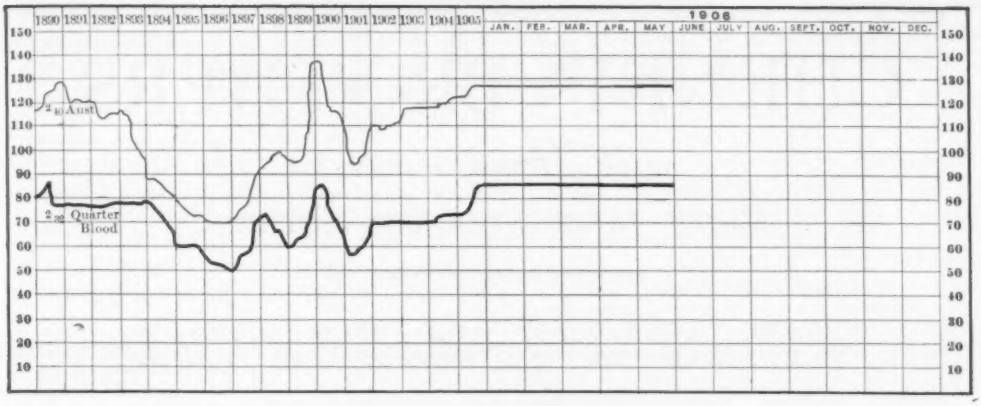


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

buyer to make the cloth. There are no large stocks of light weight cloth on the market although the cancellations of heavy weights have been heavy, especially in the case of one very large weaving mill. As the season progresses the orders so cancelled may be sold to the trade, as certainly there is a shortage of heavy weight cloth, notwithstanding the fact that the past winter has been an open one.

The demand for astrakhan is coming in again and knitters already have samples on the market and some substantial orders have been secured. Some weavers got spinners to make stock yarn, stating that while they would not place orders yet they would without doubt use all the yarn so spun, but the spinners have this yarn as the orders have not been forthcoming. Some weavers are trying to place orders for delivery in August at 5 cents per pound off the market price, but are not succeeding.

Knitters are buying yarn for Jersey cloth for overshoe lining on a basis of $1.25 for 1/45s Australian. The French-spun spinners continue busy and have a good prospect. The knitters are using much worsted yarn, with a percentage of Peruvian cotton. The hosiery manufacturers are buying yarn with 50 per cent. black cotton and 50 per cent. wool to make a yarn that will make hosiery at a price satisfactory to the buyer.

The combers continue busy, but are forced to maintain high prices for tops on account of the high price of wool. The outlook for yarn depends upon the amount of orders secured for the coming light weight season, and although the volume of business will be large for cloth, yet much cotton will displace worsted yarn. The cloth will be half cotton and half worsted.

We quote as follows:

2/4s Australian	1.28
2/40s Delaine	1.23
2/36s 1/4 to 3/8 Blood	1.00-1.02 1/2
2/32s 1/4 Blood	87 1/2
2/20s 1/4 Blood	82-87

Woolen Yarn.

Spinners both for sale and commission work are busy and the orders secured will easily run them well into November. The demand for the sale yarn comes from dress goods weavers, men's wear weavers, hosiery knitters, eiderdown knitters, and manufacturers of French flannels.

Prices are well maintained and lower prices are impossible. The spinners are in an easy position as to orders as more work is at hand than can be well handled. The coming light weight season will call for much woolen yarn as a substitute for worsted yarn and many of the woolen mills that were unable to run during the heavy weight season because of the so-called worsted season will this coming season secure a fair amount of business on the homespun effect cloth. Throughout New York State the knitters are placing orders for yarn and stock of all kinds.

*Tennessee, Rotherwood. The Unaka Corporation, which has purchased the Rotherwood Woolen Mills, will make no changes at present to the buildings nor machinery additions.

Texas, Bonham. At meeting held recently by the directors of the Bonham Cotton Mill, it was voted to increase the capital stock to $200,000. The company has recently made additions to the plant.

Texas, Fort Worth. The Home Industry Club is reported as interested in securing the establishment of a large cotton mill by Eastern capitalists.

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. **George W. Chapin** 229-231 Church St. PHILADELPHIA

NON-FLUID OILS

HONESTLY NOW, which does your machinery generally need *more*—oiling or wiping?

NON-FLUID OILS lubricate like oils but do not waste, do not drip and are not thrown around where they are not wanted. Every drop is used for lubricating and none for soiling machinery, walls, floors, goods and clothing. Send for sample and test it. The results will more than please you. We send samples free and prepay charges.

NEW YORK & NEW JERSEY LUBRICANT COMPANY,
Dep't H. 14-16 Church Street, New York City.

*South Carolina, Union. The plants and accounts of the Union Cotton Mills of which T. C. Duncan was formerly president, have been sold at auction by Christie Bennett, who was appointed by the Federal court to conduct the sale. The property was bid in by W. M. Elliott of Columbia, attorney for the Union and Buffalo Mills, the purchase price being $1,238,400, being just $32.74 more than the upset price fixed by the Federal courts. The bid by Mr. Elliott was the only one made. Mr. Roberson required the deposit of a certified check for $50,000. The plant was purchased for the reorganization committee and the company will continue the operation of the plant. Since the reorganization committee has had charge of the affairs of the mill, it is understood that it has been making money. The goods in the mill were appraised by A. W. Smith, of Spartaburg; H. L. Moody, of Victor Mills, and T. J. Britton, of Spartan Mills. The new agent, Hartley L. Lord, formerly of Chicopee Falls, Mass., takes charge June 1st.

*Wisconsin, La Crosse. The Onalaska Woolen Manufacturing Co. has begun moving the machinery of the knitting department at Onalaska to this place, where a building has been recently purchased. The balance of the company's machinery will be moved after present orders have been filled.

*Wisconsin, Manitowoc. The Wisconsin Knitting Mills, incorporated with capital stock of $25,000, in building formerly occupied by the Wisconsin Knitting Mills Co., will start work about June 1st on an addition to the plant. They now operate 22 knitting and 11 sewing machines, making sweaters, cardigan jackets, golf and athletic goods, selling product direct.

Wisconsin, Menasha. The Menasha Woolen Mills Company has been incorporated with capital stock of $75,000. W. P. Hewitt, M. P. Hewitt and J. L. Pinkerton are the incorporators. This may be an incorporation to continue plant of W. P. Hewitt & Co.

Wisconsin, Menasha. The Fox River Valley Knitting Co. is reported negotiating for purchase of the Germania Opera House, for purpose of remodeling same for warehouse and shipping room. If they are not successful in securing same, a new addition will be built.

G. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Secy.
Established 1880—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.
Boston Office, 200 Summer St.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

Knitting and Weaving
YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Official American Textile Directory.

The TEXTILE WORLD RECORD, which for years has compiled and published the ANNUAL OFFICIAL DIRECTORY OF THE TEXTILE INDUSTRIES, has bought the AMERICAN TEXTILE DIRECTORY, and will merge the two Directories, retaining the special features of each, and with the combined subscription and sales list of both.

It will be published in two editions, viz.: the Office Edition, price, $3.00, and the Travelers' Edition, smaller in size, with thin paper and flexible binding, price, $2.00. The combination price for the TEXTILE WORLD RECORD and DIRECTORY will be $3.00 per year with the Travelers' Edition, and $4.00 per year with the Office Edition.

Those customers who have already placed their orders for either publication may be assured that the combined Directory, known as the OFFICIAL AMERICAN TEXTILE DIRECTORY, will be better than they stipulated for.

The 1906 Edition will be published in July as usual and will be delivered promptly to Subscribers and those whose orders are in hand.

CONTENTS.

THE MAP FEATURE was originated by the Textile World in 1894, and is copyrighted. There are 19 of these textile maps, which show only the cities and towns where there are textile establishments.

A COMPLETE DIRECTORY OF MILLS including Cotton, Woolen, Knitting, Silk, Flax and Jute Mills of the United States, Canada and Mexico, together with the Dyeing and Finishing Works, Bleacheries, Print Works and other Textile Establishments.

Full information is given about each mill in almost every instance, viz.: the name of the company or firm, names of officers, agent, superintendent, the character of goods made, the machinery equipment, i. e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dye house or not, the names of the selling agents or if the mill sells direct, and in many instances the name of the man is given who buys the raw material and supplies. In this section of the Directory, all the mills in one place are arranged under the head of that town, but so designated that the kind of a mill is determined at a glance by boldface letters, so that a person looking, for instance, only for woolen mills, can pick them out at a glance. This system of arrangement is conceded to be the most convenient of any, as it groups all the mills in one town together and is self-indexing, while at the same time those interested in a particular class of mills, such as cotton, silk or knit, can find them as easily as if they were classified separately.

AN ALPHABETICAL INDEX to the textile establishments in the United States.

MILLS WITH WORSTED MACHINERY. A separate list is compiled of mills with worsted machinery for the convenience of those dealing exclusively with that branch. This is a feature unique in this Directory.

THE TEXTILE MILLS IN MEXICO. This feature of the American Textile Directory is continued and brought up to date by the latest information.

THE YARN TRADE INDEX. In this department are classified lists of manufacturers of different kinds of yarn who spin for the market. It gives the size of yarn spun and the form in which the yarn is put up, together with the selling agents of the mills, or, if sell direct.

COMMISSION AND ORDER SECTION. In this department are classified lists of establishments doing dyeing, bleaching, printing, finishing, and mercerizing on order, sub-divided according to the class of work done.

RAW MATERIAL SECTION. In this department are complete lists of dealers and brokers in wool, cotton, shoddy and extracts, and wholesale rag dealers.

SELLING AGENTS AND DRY GOODS COMMISSION HOUSES in the principal cities of the United States, giving the character of goods handled.

MANUFACTURING CLOTHIERS in the principal cities, buying from first hands, giving the class of goods made and in most instances the name of the buyer.

SUIT AND CLOAK MANUFACTURERS in the principal cities, buying from first hands, giving the class of goods made and in most instances the name of the buyer.

MACHINERY AND SUPPLY SECTION. This contains a carefully classified index of over seven hundred builders of textile machinery and dealers in mill supplies.

LORD & NAGLE COMPANY,

PUBLICATION OFFICE, . . . 299 DEVONSHIRE STREET, BOSTON.

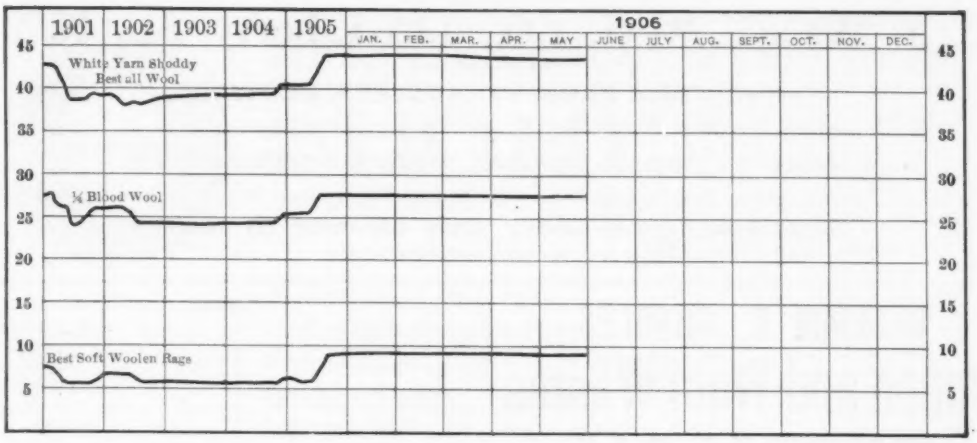


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Rag and Shoddy Market.

It is not strictly correct to say "nothing doing" in this market, but the expression is not far from the truth. Here and there may be found buyers who have found it necessary to replenish stocks, but as a rule spinners can use but a very small quantity of wool shoddy in the goods now in demand. Wool is high, but the needs of the consumer are supplied by cotton when he is unable or unwilling to pay the price for all wool. Collections of rags are restricted by the lack of demand. This accounts for the firmness of prices in the face of the cessation in the demand for stock. As to the future, one man's guess is as good as another's. One thing is certain, however, and it is that any improvement in the rag and shoddy market must wait upon a return of woolen cheviots to popular favor.

SHODDIES AND EXTRACTS.

White yarn, best all wool	44-47
White knit, all wool, best fine	35-40
White knit, No. 2	30-35
Light yarn, extra fine	30-35
New pure indigo blue	28-30

Merino.

Fine light, all wool	24-27
Medium light, all wool	15-17
Fine black, all wool	25-27
Fine dark, all wool, best grade	22-25
Medium dark, all wool, No. 1	18-20
Medium dark, all wool, No. 2	15-16
Red knit stock, strictly all wool	20-22
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	20-22
Dark blue for hosiery, not all wool, No. 2	15-18

WOOLEN RAGS.

Fine merchant tailors	10-11
Choice light colors	13-14
Browns	12-13
Blacks	9-10
Fine blues, plain	9-10
Fine dark	12-13
Medium dark	7-8

Worsteds.

Blue	15-17
Black	21-22

Serges.

New black	16-18
New blue	14-16

Flannels.

New scarlet	19-20
New blue	15-16
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	9-9½
Old white flannels	23-24
White flannels, No. 2	11-12
Old red flannels	13½-14
Light blue flannels	7½-8½
Old blue flannels	9½-10
Old plaids	7-8½
White stockings	24-25
White hood stock	24-25
Clear hoods	9-10
Blue stockings	8½-9
Fancy stockings, No. 1	9½-11
Gray stockings	10½-11
Black stockings	11-12
Knit stock comforters	7-8
Red knit	13½-14
Light gray knit	10½-11
New light fancies	14-15
New fancies	11-12

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Light, fine	16-17
Light, coarse	7¼-7½
Fine, dark	14½-15½
Coarse, dark	6½-6¾
Blue	11-12
Blue—seamed	
Black—seamed	15-16
New black	18-20
Small	4¼-4¾
Bunting	7-10

FLOCKS.

Shear, fine white, all wool	10-12
Fine indigo blue, all wool	7-8
Fine black, and blue, all wool	6-7
Fine dark, all wool	2½-4
Gig, fine, all wool	2-3
No. 1 black, all wool cut	6-10

COTTON WASTE.

No. 1 Spinners	10-10½
No. 1 Machine	5-5½
No. 2 Machine	4¼-4¾
Machine Cop	7½-8¾
No. 1 Cop	8½-9
No. 1 Card	8-8½
No. 2 Card	7½-8
No. 1 Oily Card	4½-5
No. 2 Oily Card	3½-4
Peeler Combing	10-10¼
Egyptian Combing	10-10¼
No. 1 Linters	6-6½
No. 2 Linters	5¼-5¾
White Clips	4½-5
Colored Clips	1½-2¼

*Wisconsin, Menasha. We have been advised by W. P. Hewitt & Co. that their company is now known as W. P. Hewitt & Co., Inc.

Wisconsin, Waupaca. The Waupaca Woolen Mills, operated by John W. Evans, have been sold to Proctor Bros. of Genessee, Wis.

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ASSETS January 1st, 1906	$21,239,052
LIABILITIES (Including Capital)	12,518,551
NET SURPLUS OVER ALL LIABILITIES	8,720,501
Surplus as regards Policy-holders	11,720,501
Losses Paid Since Organization Over	99,000,000

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Acids.

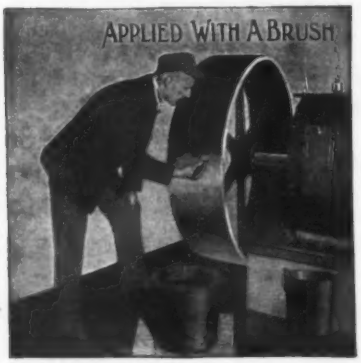
Acetic, 100 lbs.	2.25-2.50
Citric, domestic	43-43½
Oxalic	5¾-6¼
Sulphuric, 60 deg., 100 lbs.	1.00-1.20
Muriatic, 18 deg.	1.15-1.75
Tartaric crystals	28-28¼

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.35-2.40
Alum, lump	1.75-1.85
ground	1.85-1.95
powdered	2.75-2.80
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	5¾-6⅛
Borax, bbls.	7½-8½
Brimstone, crude, foreign ton	22.12½-22.62½
Copperas	52½-65
Cream tartar, crystals	22½-22¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	45-50
Potash, chlorate, crystals	8½-9¼
powdered	8¾-9½
carbonate	3¾-4¼
Soda ash, carbonate, 48 per cent.	1.20-1.30
high test	1.00-1.25
Soda, bicarbonate, English	
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	60-70
Sulphate, alumina	1-1¾
Vitriol, blue	6-6¼

Dyestuffs.

Acetate of soda	4¼-4½
Acid, picric, best crystals	22-27
tannic, commercial	32-34
Albumen, egg	51-65
blood	20-27
Alizarine, red	15½-16½
Aniline, oil	9¼-9½
salt crystals	8½-8¾
Antimony salt, 65 per cent.	21¼-23½
Bichloride of tin, 50 per cent.	11¾
45 per cent.	10½-11¼
Bichromate of potash, American	8¼-8½
Bichromate of soda	6¼-6½
Bisulphate of soda	80-1⅜
Cutch, mat	5-5½
boxes	6-7
Dextrine, imported potato	6-7
corn	2.85-3
Divi-divi, ton	27.00-35.00
Flavine	23-40
Fustic, stick, ton	17.00-20.00
young root	45.00
Gambier	4-4¼
Hypo. of soda, Am. bbls. cwt.	1.40-1.50
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's	47½-60
Gautemala	35-70
Manila	43-45



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Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	16.50-21.00
roots	15.50-16.50
Madder, Dutch	12-14
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¾-1½
Nutgalls, blue Aleppo	23-25
Persian berries	7
Phosphate of soda	1.90-2¼
Prussiate of potash, yellow	14¾-15
Quercitron, ton	20.00-22.00
Starch, corn, pearl, bbls.	2.10-2.85
corn, pearl, bags	1.85-2½
potato	3½-3¾
rice	6½-7½
wheat	5-6
Stannate of soda	10-20
Sumac, Sicily, No. 1, ton	48.00-51.00
Sicily, No. 2, ton	44.00-47.00
Tapioca flour	4-5
Tin crystals	25-30
Tumeric, Madras	5-5⅛
Zinc dust	5⅝-5¾

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The best, cheapest and most satisfactory covering for winder bobbins. Will fit on any style or size.

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*Massachusetts, Spencer. The Joseph F. Wicks Woolen Co. has been incorporated with capital stock of $12,000; Wallace H. Leavitt is president of the company and Joseph F. Wicks, treasurer.

Massachusetts, Taunton. The New England Cotton Yarn Company is reported as endeavoring to secure the lease of the Taunton Locomotive Works building, for purpose of converting into a storehouse.

*Minnesota, Winona. The Union Fibre Co.'s plant, recently destroyed by fire, will probably be rebuilt at this place.

*New Hampshire, Keene. Owing to the failure of the citizens to provide the necessary capital, the proposed plant of the Monadnock Hosiery Co. will not be established.

New Hampshire, Newport. It is reported that effort is being made to start a cotton mill in the Knipe shoe factory, which has been closed for some time.

New Jersey, Ridgewood. The O'nee Knitting Mills have been reported incorporated with capital stock of $25,000 for purpose of making hosiery and underwear. J. Shackimer and R. C. McCormich (New York) and C. W. Erchells, Jr., of this city, are mentioned as interested.

New Jersey, Vineland. The S. J. Levy Hosiery Co. has succeeded to the business of the Karl & Levy Hosiery Co. The plant is in full operation on ladies', men's and infants' hosiery with equipment of 71 knitters.

New York, Baldwinsville. It is reported that a proposition has been made through the Young Men's Business Association, by A. F. Nellis, of Phoenix, to establish a branch mill here, provided a building be given for the purpose.

New York, Corning. Arrangements are being made by F. P. Merrill, of the Merrill Silk Glove Co., to establish a plant at this place.

New York, Fonda. The Empire Fabric Co., with a capital of $7,500 has been incorporated to continue the business of the Dexter Silk Mills. The directors of the new company are Joseph Bachner and August Klein, both of Gloversville, and William Dexter, of Fonda. The main offices of the company are to be at Gloversville.

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How is this problem solved?
How is this fabric made?
Why is this fabric better than that?

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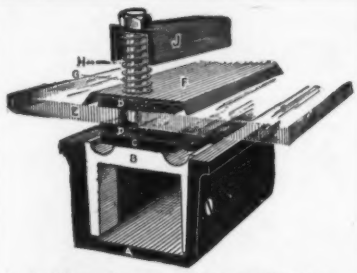

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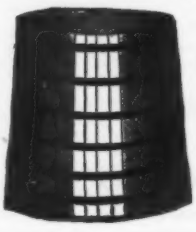

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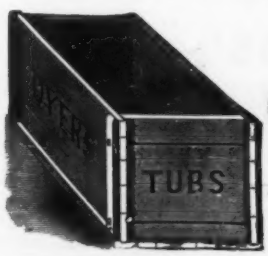

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2915-2933 North Second Street,
PHILADELPHIA, PA.

Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

Down Town Office, 140 Chestnut Street, Corner Second.
Hours from 12 to 1.

Kiers and Steam Boxes

BOILERS, TANKS, PLATE WORK

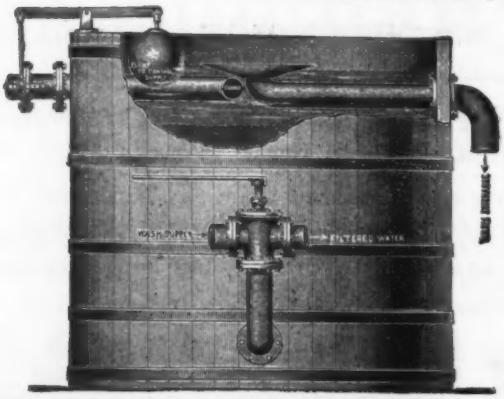
Special Attention
Given to Repairs

Wm. Allen Sons Company,

65 Green St., Worcester, Mass.

NORWOOD ENGINEERING COMPANY,

FLORENCE, MASS.

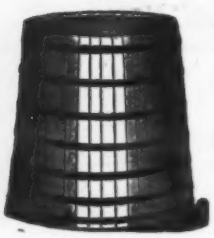


WILSON FILTERS FIRE HYDRANTS

Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

G. WOOLFORD WOOD TANK MANUFACTURING CO.

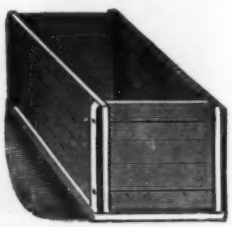
MANUFACTURERS OF



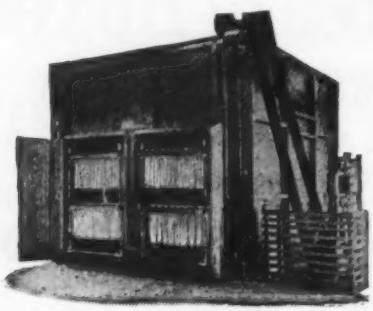
CEDAR AND CYPRESS
TANKS AND VATS

For Bleaching, Dyeing and Finishing.

Reservoir Tanks of any Capacity or Shape for Sprinkler Systems and all purposes.



Office, Land Title Building, Broad and Chestnut, Phila., Pa.



FRANK BAILEY,

BUILDER OF

YARN DRYING MACHINERY

ON THE

COLD AIR SYSTEM. Simple, effective, inexpensive. Leaves yarn in beautiful condition. Also on the **HOT AIR SYSTEM** when great capacity is wanted.

Builder of Fans, Trucks for Yarn Dryers and Dye Houses.

DYE STICKS, Kettle Sticks and dry and sulphur house Poles, also Sticks to suit the Wolstenholm Machine from natural water grown cedar, and Sticks to suit the Klauder-Weldon, Lorimer and Hussong machines from finer grades of lumber. These Sticks have been thoroughly tested, and pronounced the best on the market. Guarantee satisfaction to buyers. Write for prices.

WORKS AT BRADDOCK, P. O. ADDRESS, CEDAR BROOK, CAMDEN COUNTY, N. J.

Beaumont's Patent Cop Dyeing BLEACHING and SIZING MACHINES

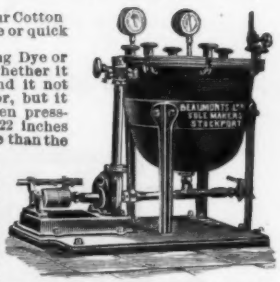
VACUUM MACHINE.

This machine will dye large, hard twisted, twine cops. It will dye or bleach any size of cotton cops. It will scour wool or worsted cops, cheeses and tops. It will scour or dye waste cops. This is a good machine to work in conjunction with the Vacuum and Pressure Machine for washing off, etc.

Vacuum Machines made	No. 1	No. 2	No. 3	No. 4
of Copper and Brass	£30	£45	£85	£130
Machines made of Iron	28	38	65	90

This machine will Dye, Bleach, Size and Scour Cotton Hemp, Woolen, etc., in the form of Cop, Cheese or quick traverse bobbins, any thickness or length.

This Machine will circulate absolutely boiling Dye or Size Liquor through every fibre of the yarn, whether it be cop or cheese which is under treatment, and it not only circulates this boiling Dye or Size Liquor, but it forces it into the fibre of the yarn under an even pressure of 10 lbs., and this is more than equal to 22 inches of vacuum; it is **three times** more effective than the ordinary Cop Dyeing Machinery.



This machine will dye evenly and thoroughly through every fibre of the Cops while the spare Cop plate is being refilled with Cops; **in fact it will do this in six minutes.**

Can be depended upon to dye a perfectly even shade all through the yarn, and will dye the most delicate colors. It will dye silk Cops or treat them with any necessary liquor. It will scour or dye wool tops. It will scour or dye large hemp cops and cheeses. It will scour and dye waste cops. We are the Patentees and Sole Makers.

Machines made of Copper	No. 1.	No. 2.	No. 3	No. 4.
and Brass . . .	£40	£65	£115	£170
Machines made of Iron .	35	50	75	110

We supply Two Sets of Skewers and Two Cop Plates with the Machine, whether it is for Weft Cops, Twist Cops or Cheeses.

BEAUMONT'S LIMITED, Brinksway, Stockport, England.

LOCATIONS FOR NEW INDUSTRIES

can be secured on the lines of the

Chicago, Milwaukee & St. Paul Railway

in the great middle west. It reaches the Copper Country and the pine and hardwood areas of Northern Michigan, the lead, zinc and iron regions of Wisconsin, the coal fields of Illinois, Iowa and Missouri.

Traverses the great agricultural and manufacturing states of Iowa, Minnesota, North and South Dakota. Operates 7,000 miles of thoroughly equipped railroad.

Correspondence is solicited with eastern manufacturers who desire to move their factories to, or establish branches in the West. Co-operation with Business Men's Associations on the lines of this railway in all matters affecting mutual interests is assured.

Inquiries should be as definite as possible.

Address

Industrial Department

Chicago, Milwaukee & St. Paul Railway

Room 1327, Railway Exchange

Chicago

THE COHNEN

CENTRIFUGAL

Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock

or

Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS

without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING

is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

A. KLIPSTEIN & CO., 122 Pearl St., NEW YORK.

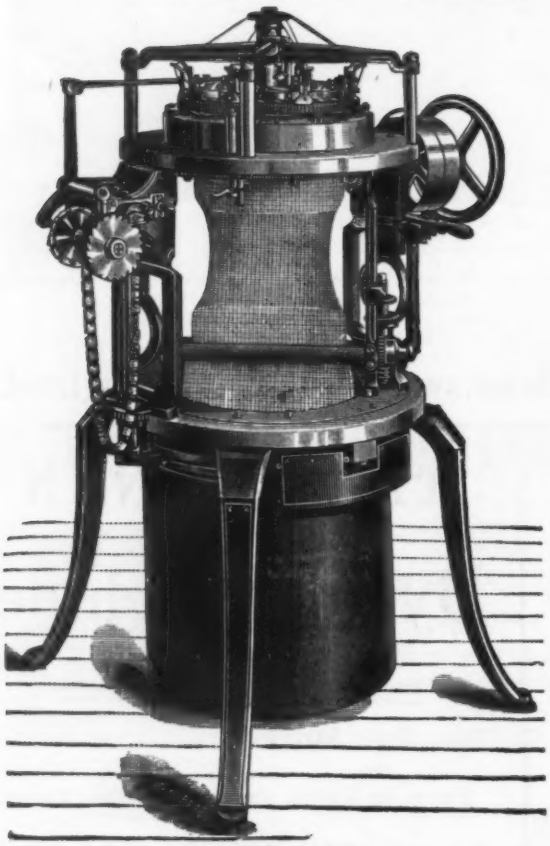
WILDMAN MANUFACTURING COMPANY

(Formerly McMichael & Wildman Mfg. Co.)

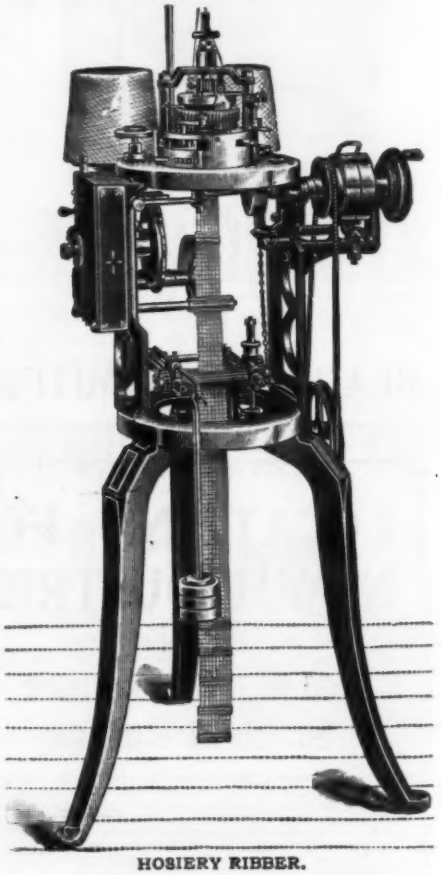
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

WILDMAN MFG. CO.

NORRISTOWN. PENN.

The most advanced types of straight bar

KNITTING MACHINES

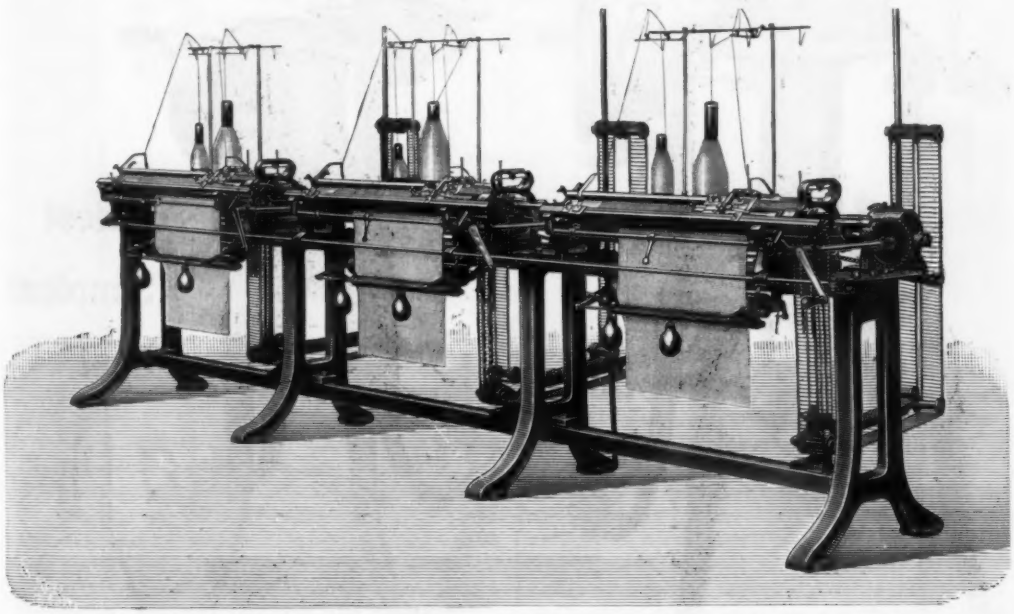
for the manufacture of full-fashioned hosiery (cotton, lisle or silk), in all gauges from 14 to 32 needles (spring beard) to the inch, from 12 to 24 sections; for the manufacture of full-fashioned shirts and drawers from 6 to 10 sections with automatic narrowing and widening, built by

SCHUBERT & SALZER

in Cotton-system, of superior quality and construction, with split, striping, single and double lace attachments.

Also machines with latch needles, hand or power motion, for the manufacture of Sweaters, Cardigan Jackets, Ladies' Blouses, Vests, Gloves, Mittens, etc.. built by

SEYFERT & DONNER



This picture represents one of Seyfert & Donner's full automatic power knitting machines, with chain drive. Each head on stand works independently and can have needle beds of different gauge and width. The machine is fitted with three automatic thread-carriers, two for striping and one for the dividing thread, self-acting lock for welt and royal rib, racking arrangement for whole or half revolution, take-up rollers for endless goods, automatic and electric stop motion.

OTTO WALTHER,

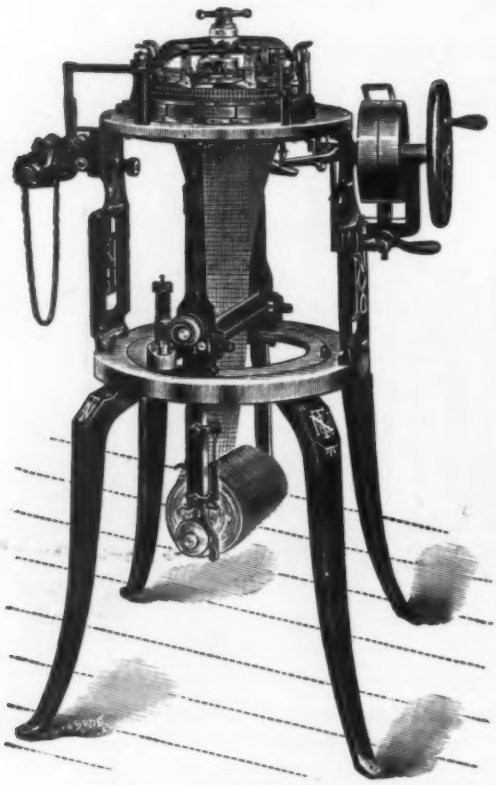
507 Bourse Bldg., = = Philadelphia

NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



LATEST IMPROVEMENTS
QUALITY OF FABRICS AND PRODUCTION
UNEXCELLED

NYE & TREDICK CO.
606 Arch St., PHILADELPHIA, PA.

If You Want

Largest Production For Least Money

Write

Geo. D. Mayo Machine Co.,
Laconia, N. H.

Latest
Simplest
Best

MAYO'S

New Full Automatic Knitter.

PHILADELPHIA OFFICE,
KNICKERBOCKER BLDG., COR. SIXTH AND ARCH STS.,
B. M. DENNEY, REPRESENTATIVE.

Friedberger-Aaron
Mfg. Co.'s
Braids and Laces

The recognized

Standard Finish

for

Trimming Ladies'

RIBBED UNDERWEAR

GERMANTOWN, PHILADELPHIA

P. O. Address, Logan Station.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

A RARE OPPORTUNITY TO BUY.

500 Payne bobbins.
12 Standard "B" 160 Needle Knitters.
1 Bruce band folder and cutter.
1 Weston & Dennis Press, 32x40 in., 15 Hollow Plates.
Lot hosiery stamps, boards, etc.
38 Beattie & Hepworth & Abel loopers.
6 Hosiery presses (lever).
114 Lamb and Grosser sweater machines.
200 Ribbed underwear machines, various sizes.
50 Brinton & Co. ¾ aut. knitters, sizes.
30 Union Special machines, various styles.
1 Rotary fire pump.
1 Buffalo-Blower.
100 feet woven rubber hose, 3 inches dia.
2 paper cutters.
5 Toque machines.
30 Mayo machines. Various sizes.
100 Brooks welters.
8 Fleecing machines. (Nappers.)
98 Brinton & Co. and other make hosiery ribbers.
40-Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
4 Lindsay & Hyde & Allen winders.
2 Grosser Jacquard machines for gloves.
1 Cyclone dryer.
2 Typewriters.
5 Band folding and cutting machines.
1 30-inch ventilating fan. 1-36 inch ditto.
1 Centrifugal Pump.
1 Small Steam Pump.
1 Small Belt Pump.
15 Rudolph Seaming Machines.
2 Lamb border machines, auto. rack.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.

The Merrow

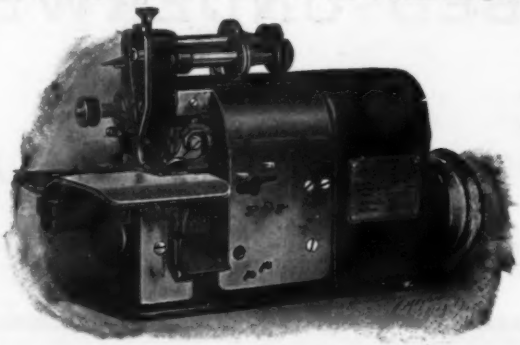
High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

STYLE 35 B SHELL MACHINE

For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



USE STYLE 17 or 22 for Bed Blankets and STYLE 18 for Horse Blankets.

Send for Catalogue and Samples.

THE MERROW MACHINE CO.

Knickerbocker Building, Sixth & Arch Sts., Phila. HARTFORD, CONN. 346 Broadway, New York

THE GROSSER KNITTING MACHINE CO.

WOOL EXCHANGE
Rooms 400-421

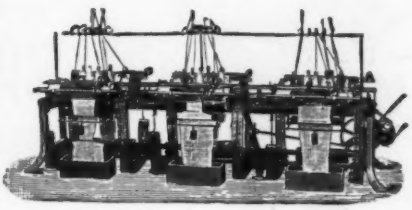
MAX NYDEGGER

260 W. Broadway
NEW YORK

SPECIAL MACHINES

FOR ANY ARTICLE THAT IS KNIT

GROSSER Flat Knitting Machines
For HAND power or **Fully Automatic Power Machines.** Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand. Power Machines to be seen in operation.



COTTON PATENT HOSIERY MACHINES
For automatic production of **Full Fashioned Hosiery, Fine Half Hose, Ladies' Lace Hose, Fine Underwear**; high speed, large production. All gauges, and any number of sections, from 2 to 24.

FRENCH FRAMES
C. TERROT SÖHNE, Cannstatt, Würt, famous builders of the best Circular Frame for **Finest Underwear, Fleece Linings, Gloves, Special à-jour** (open work) **Fabrics, etc.**

RASHEL MACHINES
For Fancy Goods in largest variety, **Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc.,** in silk, wool, cotton

SPOOLERS, Paraffiners, Finishing Machines, for the knitting business.

Exclusive Agency for the Famous

Julius Hoehler DIAMANT OVERSEAMERS, indispensable for all full fashioned articles, Hosiery, Gloves, Jersey Sweaters Sporting Goods, etc.

LOOPERS Double thread Lock stitch, self-cutting and cleaning attachment. Reliable money saver.

FRITZ ZACKE LATCH NEEDLES, for any purpose in the knitting line, patented rivets.

Samples, Specifications, Prices, etc., upon application

WALTER & CO., Limited

Mühlhausen i/Thür, Germany.

SPECIAL MANUFACTURERS OF

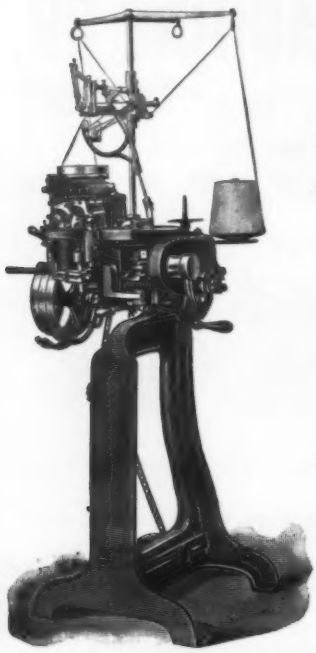
Knitting and Winding Machines

for hand and power driving, of best quality and perfect construction.

Specialty: Jacquard Machines

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

PRICE LISTS AND SAMPLE ON APPLICATION



Also Furnished for Bench.

The Invincible

"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.

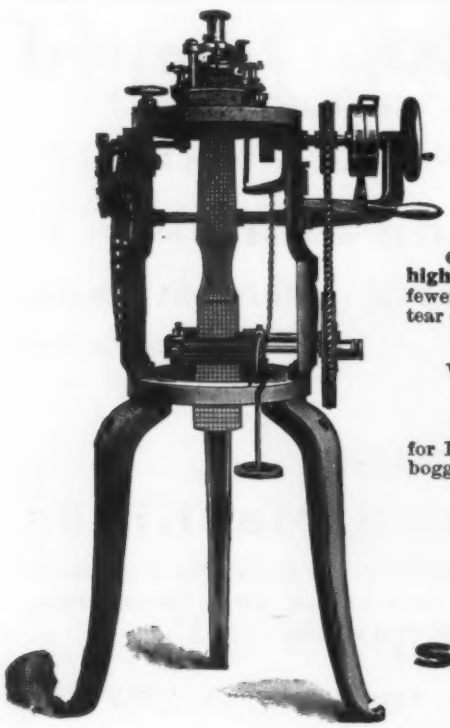
SIMPLE, POSITIVE AND EASY TO OPERATE.

E. JENCKES MFG. CO.

Pawtucket, R. I.

R. M. OATES, Hendersonville, N. C., Southern Representative.

PHILADELPHIA OFFICE, 101 North Sixth St.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

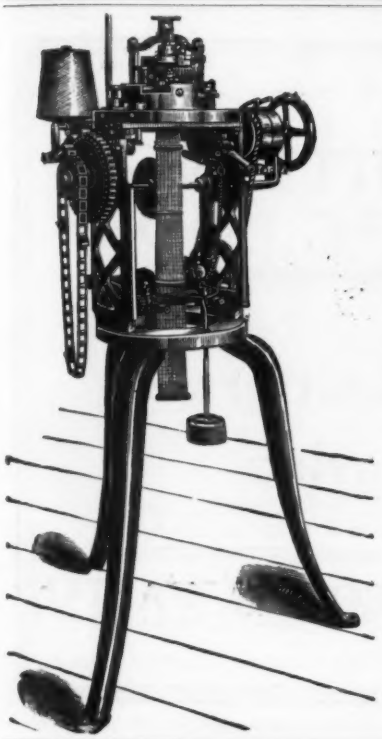
STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

LITTLE FALLS, N. Y.



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

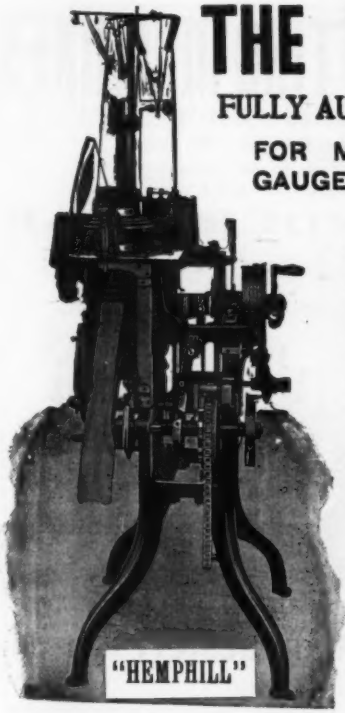
Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

THE TWO LEADERS

FULLY AUTOMATIC HOSIERY KNITTERS

FOR MAKING ALL KINDS AND GAUGES OF SEAMLESS HOSIERY



One with **GEARS**, the other with **CHAIN** for pattern mechanism, to meet the various tastes of different manufacturers.

Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

Write us for further particulars and prices.

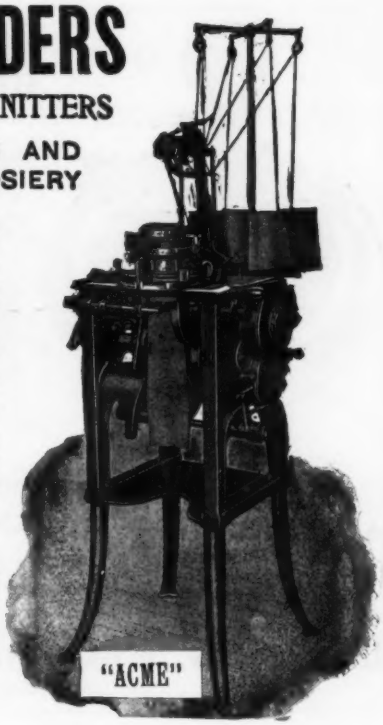
We also make all kinds of **LATCH NEEDLES.** Many leading manufacturers use our needles and say they are the best on the market. Send us a trial order.

MAYO

Knitting - Machine and Needle Co.,

FRANKLIN FALLS, N.H.

Philadelphia Office, Knickerbocker Bldg., Cor. 6th & Arch Sts.



EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

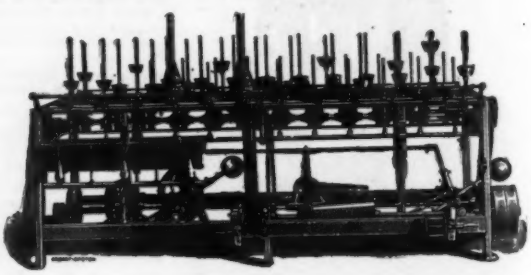
MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

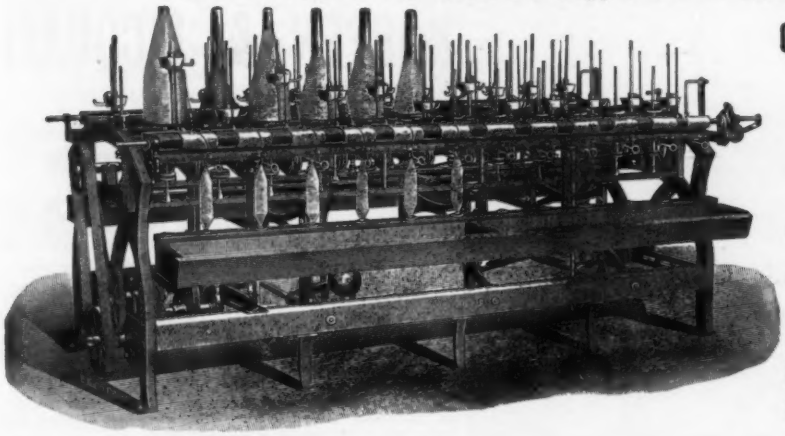
ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1902.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

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Pawtucket, R. I.

WILLIAM C. BULL, BENNINGTON, VERMONT.

MAKER OF

For Ladies', Gents' and Children's Goods.
Latest Styles.
Best Workmanship.

Drying Form Boards

OF EVERY VARIETY.

WORKS: CHEMNITZ, SAXONY. Established 1851.

G. HILSCHER

Full-Fashioned Hosiery and Underwear Machine Builder

Sole Agent for United States and Canada

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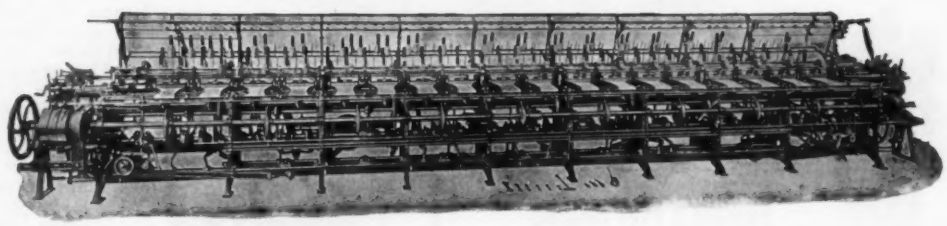


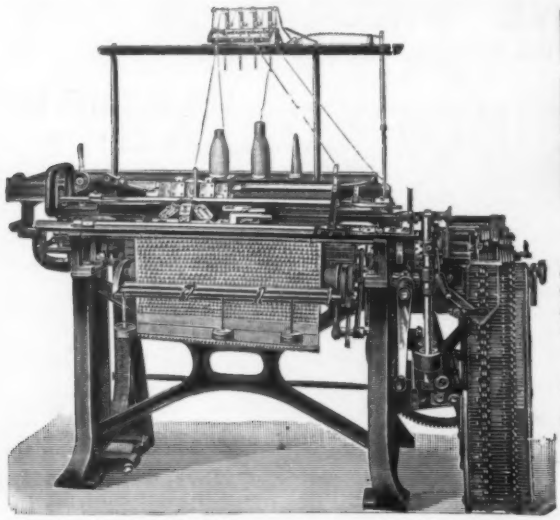
"Awarded Gold Medal at World's Fair, Paris, 1900,

for highest improvement in the mechanism of manufacturing full-fashioned hosiery, solidity and perfect workmanship in construction and superiority of fabric produced."

SPECIALTIES:

COTTON-HILSCHER HIGH SPEED SYSTEM, 68 courses per minute.
COTTON SYSTEM, for horizontal stripes up to 6 colors, Scotch plaids and vertical stripes, lace through the narrowing, split, etc., etc.
COTTON SYSTEM, wedge heel; this machine manufactures entire full-fashioned ladies hose or half hose and dispenses with the foot machine.
COTTON SYSTEM, newest construction. The new machine knits the entire hose or half hose complete down to the toe, it makes French heels and French feet.
RIB MACHINES: Cotton System, with and without narrowing.
RIB MACHINES: Hilscher System, high construction.

Machines can be seen in operation at above address.



Full Automatic NOPPEN & JACQUARD MACHINE

For High-Grade Sweaters, Jerseys, Etc. in latest plain and colored patterns.

Most durable, simplest construction! Easy to operate and adjust! Recognized as the Best in the market. One operator attends to 3 of these machines! Only reliable machine for above articles.

HIGH SPEED! LARGE PRODUCTION! IN USE EVERYWHERE!

Ask for samples and full particulars. State gauge and size you need.

CLAES & FLENTJE Mühlhausen, Thür, GERMANY.

Representatives: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N.Y., where all kinds of hand and power machines can be seen working.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country } EFFICIENT
BRUSHING MACHINERY } DURABLE
KNITTING MACHINERY } LOW IN PRICE

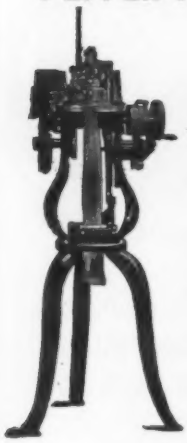
CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

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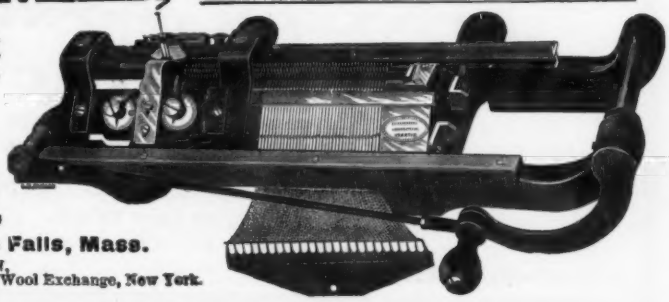

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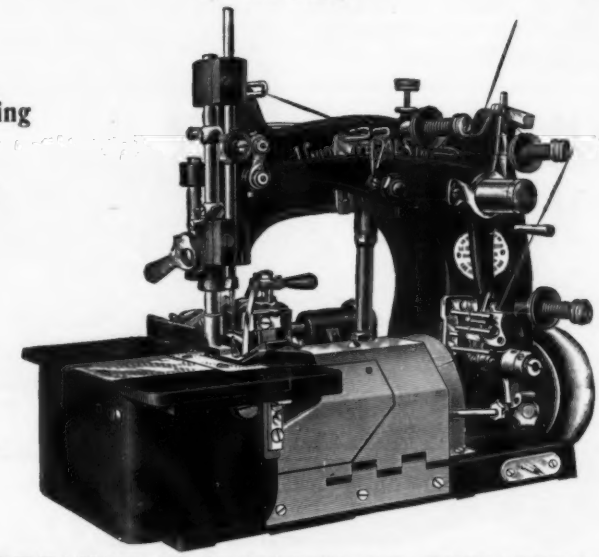

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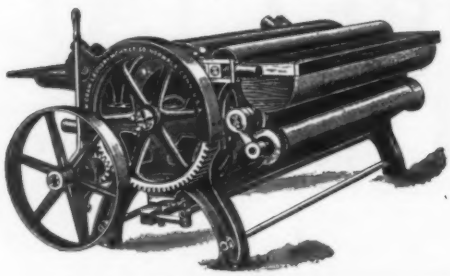

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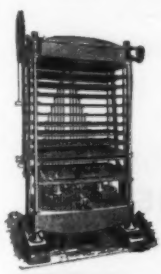

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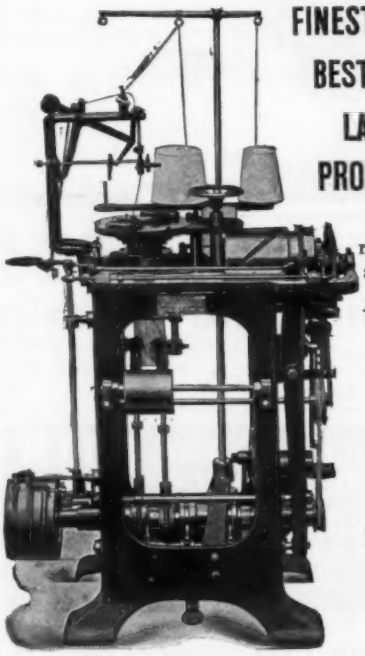

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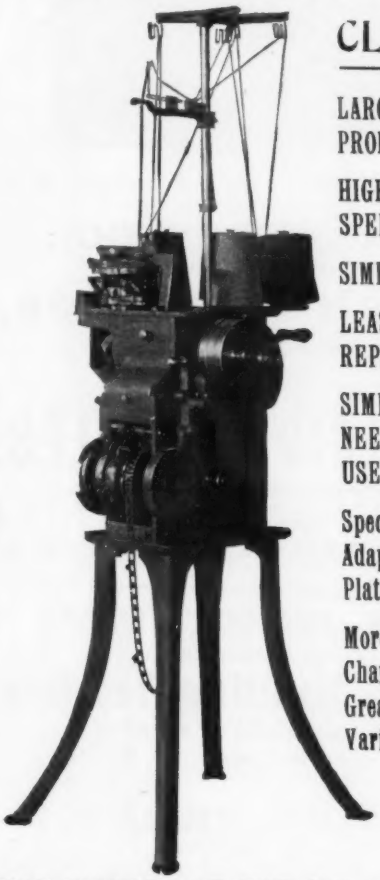

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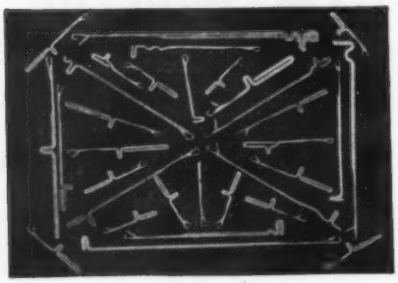

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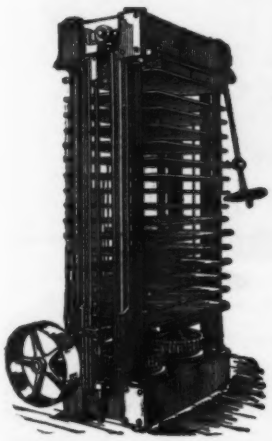

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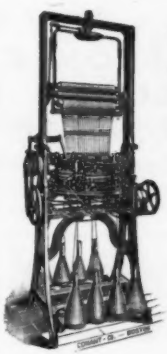

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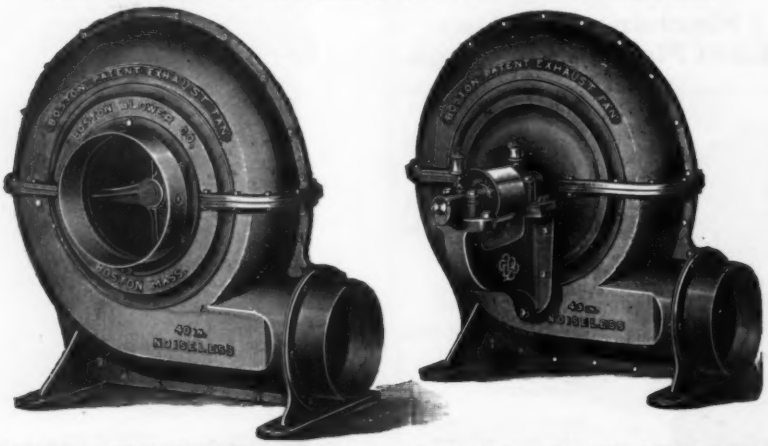
AS USED IN CONNECTION WITH PNEUMATIC CONVEYOR SYSTEM
FOR HANDLING WOOL, COTTON, RAGS, EXCELSIOR, JUTE, ETC.



Inlet Side of Right-hand Wool Exhauster. Pulley Side of Left-Hand Wool Exhauster.

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.
This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

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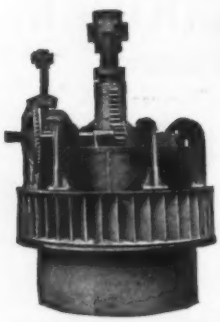

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On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

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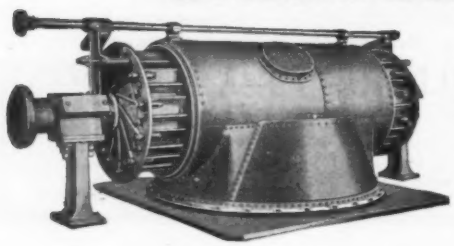

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The "ABC" Disc Fans

Strong, Durable, Efficient

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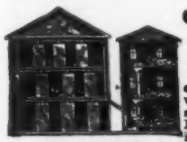

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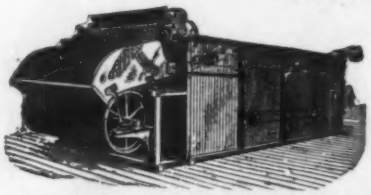

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Complete Carbonizing Outfits for Wool, Rags or Cloth.

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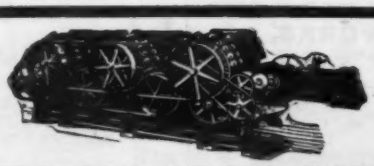

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For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.

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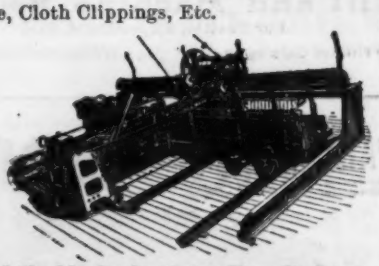

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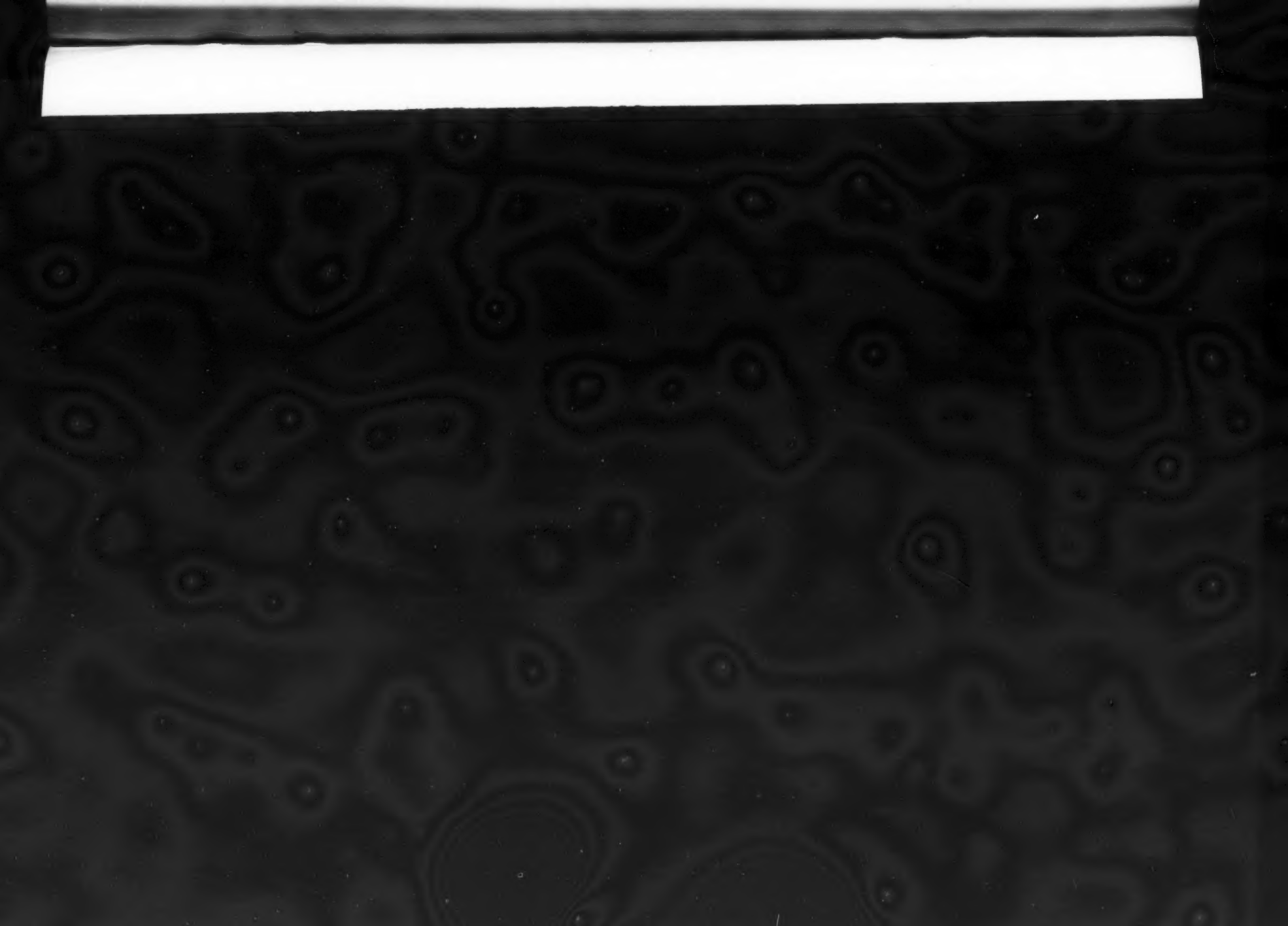

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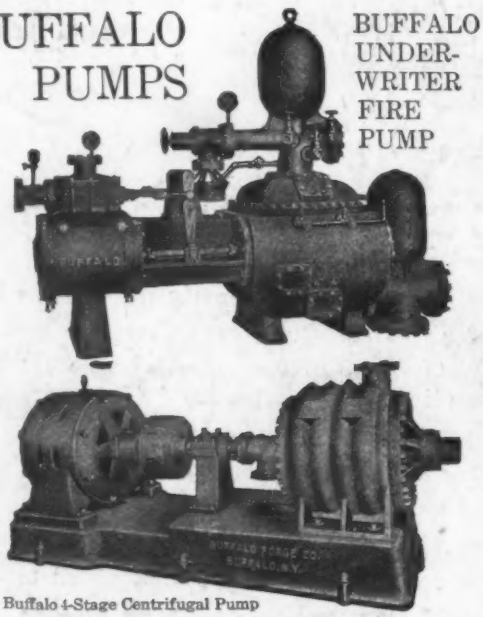

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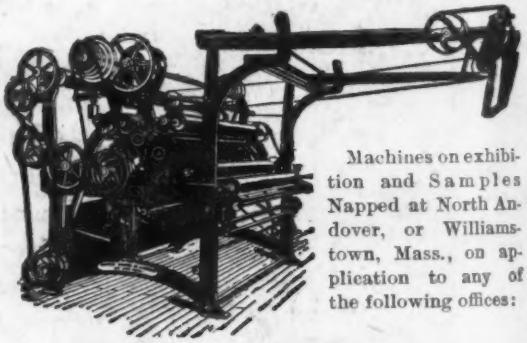

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